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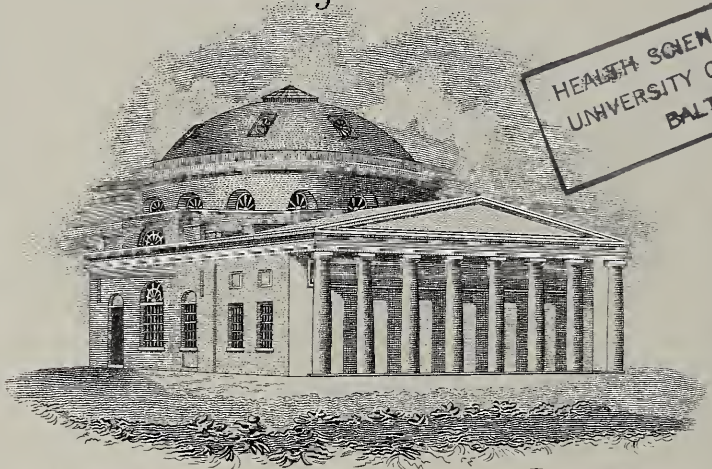

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recent review by Smith and Smith.[23] Alterations of placental function are probably reflected likewise by the changes which preeclampsia brings about in the blood concentration of such enzymes as "Pitocinase"[15] and histaminase.[2]

It has been postulated that all of these placental changes may be secondary to disturbances in the maternal blood supply to the gravid uterus,[16, 17] and that one of the results of this relative ischemia is the liberation of thromboplastic proteins from the chorionic epithelium directly into the maternal blood stream.[21] This, in turn, might account for the shortened coagulation time of the blood in eclampsia, the deposition of fibrin in the liver, the multiple capillary thromboses in the periportal areas and the increased incidence of coagulation necrosis in the placenta. It may likewise be related to the so-called "sludging of blood" observed in preeclampsia[12] or even to the activation of the fibrinolytic enzyme system of the plasma.[22]

The hepatic changes, whatever their cause may be, often result in a stretching of the liver capsule, producing epigastric pain. Thus the occurrence of epigastric pain usually indicates that acute hepatic disease exists, and one should classify such a case as severe regardless of the blood pressure or urinary findings. We have noted the disappearance of epigastric pain during the use of heparin in such cases[13] with improvement in the toxemia in three out of four. Similar results have been reported from New York and Finland.[10] Heparin is a direct antagonist of thromboplastin, and may prove to be a valuable therapeutic measure in selected cases of preeclampsia. At present, its use must remain on a purely experimental basis; it is not recommended for general use.

CHANGES IN THE VASCULAR SYSTEM

By exclusion of all other possible factors, we arrive at the conclusion that the hypertension of eclampsia is due to a widespread arteriolar constriction.[19] This, in turn, may be due to either nervous or chemical factors, and since both are obviously operative in every individual, the problem resolves itself into the relative assessment of the role of each. If the experiments of Kellar and Sutherland[9] are valid, we may eliminate the factor of sustained increase of autonomic pressor influences as a sole cause of the arteriolar constriction and focus our attention upon biochemical changes in the blood. These changes might arise primarily from the placenta, or secondarily from some other organ such as the kidney. At present there is not sufficient evidence to ascribe the hypertension to the renal pressor system, so we are still in ignorance of the ultimate cause of the raised blood pressure.

More toxemic mothers die from the secondary effects of the hypertension than from any other single cause. These effects may be observed directly in the ocular fundi, where arteriolar constriction, edema, exudates and hemorrhages occur. These are cerebral vessels, and similar changes occur in the brain. It might be said that the disasters which follow are in a way due to the lack of time which the host has to prepare for the stress of acute and severe hypertension. Neither the blood vessels nor the heart are prepared through hypertrophy to meet this stress; so we often encounter massive cerebral hemorrhage, or acute heart failure and pulmonary edema.

Attempts to ward off such accidents include: (1) use of pharmacologic agents (e.g., the magnesium ion) which may keep the hypertension within reasonable bounds; (2) preventing, with the aid of sedatives, the superimposition of further increases of blood pressure through the nervous system, i.e., maintaining a basal condition of both physical and emotional rest; and (3) fortifying cardiac action through prophylactic digitalization. Among other secondary effects of the hypertension are irreversible vascular lesions which probably occur, particularly in the kidney, and we try to prevent this by the termination of pregnancy within a reasonable period of time when we cannot "cure" the preeclampsia.

CHANGES IN KIDNEY FUNCTION

One of the characteristic signs of preeclampsia is the occurrence of gross amounts of protein in the urine. Since from a quarter to a third of this is globulin, the term proteinuria is preferable to the term albuminuria. The source of this protein is the plasma, and the cause must be looked for in the "leaks" which occur in some or perhaps in most of the glomerular capillaries. We should not think of these "leaks" as permanent holes which can be seen microscopically, but rather as transient and intermittent changes in the size of the "pores" of the filtering membrane. These may be the intercellular interstices or the cellular membrane itself. Intermittent ischemia or transient anoxia, for example, will produce such changes, and they are quite reversible.[5] The cause of this change in toxemia is not known, but it is not due to any sustained reduction of blood supply, for the total volume of blood flowing through the kidney per unit of time is perfectly normal or even increased during toxemias.[4] It is possible, of course, that there is a direct toxic damage to the membrane by some substance originating from the placenta or decidua, because lesions of this sort may be produced by the injections of various types of tissue extracts.

A certain percentage of the protein which leaks through is reabsorbed by the renal tubules. When the amount in the glomerular filtrate exceeds the quantity which can be maximally reabsorbed, then protein appears in the bladder urine. In the process of reabsorption, the tubular cells become filled with this protein and give the appearance which has been called "albuminous degeneration."[7] Some of these cells die and are shed, but for the most part tubular function in preeclampsia remains unimpaired. The tubular lesion, in the words of Addis,[1] is the result of "a suicidal endeavor of the tubules to accomplish an impossible task imposed by the permeability of the glomeruli."

As this protein-containing glomerular filtrate moves down the tubules, often at reduced rates of flow, it may become more acid until it reaches a pH at which some of these proteins are least soluble. They coagulate and form casts of the renal tubules, appearing as hyaline casts in the bladder urine. If the protein incorporates particulate material, we call them granular, while at other times the shed epithelial cells convert them to epithelial casts. Thus the casts go hand in hand with the proteinuria as influenced by the acidity of the urine.

At the same time that larger molecules are passing through the glomerular membrane, water is passing through more slowly. This may seem paradoxical, unless one conceives of a thickened but damaged filter. It is just such thickening of the glomerular wall that one sees in almost every case of fatal eclampsia, and we believe that this particular lesion may persist for many years after recovery from the toxemia.[18]

Most investigators who have studied the rate of glomerular filtration with inulin and such sugars agree that in preeclampsia there is often a considerable reduction. It may be reduced, for example, from 120 cc. per minute to 84 cc. per minute, or 30 per cent. Despite this reduction, the proximal tubules continue to reabsorb about 80 per cent, leaving only 24 liters per day instead of the normal 35 liters to be reabsorbed by the distal tubules. Now the distal tubules, which are not autonomous like the proximal segments, are under the control of the posterior pituitary gland, the adrenal cortex, and to some extent the estrogenic steroids. In preeclampsia, the distal tubules are "ill advised," for they may continue to reabsorb salt and water to a point where real oliguria results. It may be, as Ham and Landis have suggested,[8] that in toxemias the placenta elaborates an additional antidiuretic and achloruretic hormone, so that the usual wisdom of bodily economy is confused.

There are other alterations of tubular function in preeclampsia. Instead of rejecting the amino acid histidine, as the tubules do in normal pregnancy, there is a return to the non-pregnant status and the histidine is completely reabsorbed.[14] According to recent reports[6, 3] uric acid may be reabsorbed in greater quantities during preeclampsia. The elevated blood uric acid noted in the more severe toxemias, then, may be of renal, rather than of hepatic origin.

CHANGES IN SALT AND WATER METABOLISM

There is still much to be learned about the mechanisms which regulate the excretion of water and electrolytes. In normal pregnancy, it is believed that an increased level of steroid hormones originating from the placenta and adrenal cortex influences the distal tubules to reabsorb larger proportions of sodium and water. The diminution of plasma osmotic pressure resulting from dilution may be another factor. When preeclampsia supervenes, it would seem that the additional edema may perhaps best be attributed to the diminished glomerular filtration and further increase in salt or water reabsorption as already discussed.

Much emphasis has been placed in the past on the hypoalbuminemia which often occurs in this disease. Perhaps it is fortunate that such a reduction in the plasma albumin concentration does occur, however it may be brought about; because in the face of an impaired glomerular filter, the only means that the body has for improving or even continuing filtration are (a) a lowering of the plasma osmotic pressure and (b) an increase in the head of hydrostatic pressure, either by efferent arteriolar constriction or by systemic hypertension. We observe both a lowered serum albumin level and hypertension in the severe cases of preeclampsia. How these changes are brought about is a mystery. Nevertheless, I have enough blind faith in the wisdom of physiologic adjustments to injury to feel that these symptoms, though dangerous, serve a useful purpose. That purpose might well be the maintenance of placental transmission for survival of the fetus, or the maintenance of glomerular filtration for survival of the mother.

Since the incidental edema and oliguria may in themselves lead to a fatal outcome, it seems quite proper that we should sharply restrict the intake of the sodium ion and also displace it by the judicious use of such drugs as ammonium chloride. Hypertonic dextrose has proven its value. More recently, the employment of either plasma or serum albumin has proven beneficial even though their use, perhaps fortunately, does not restore the serum albumin to normal levels.

CHANGES IN THE BRAIN

Convulsions deserve our attention because their occurrence immediately adds to the risk of death. The combination of cerebral edema and hypertension appears to be the trigger mechanism that is responsible. We know, on the other hand, that the occurrence of convulsions does not always parallel the severity of the disease, and it must be that some women are distinctly more susceptible than others. Electroencephalographic studies of women who have had toxemias[20] suggest that those who develop convulsions during the course of preeclampsia have an underlying cerebral dysrhythmia. It is for this reason that the prophylactic use of either dilantin or mesantoin on all preeclamptic patients seems warranted. While it may be years before the value of such a procedure can be proven, these agents have proven their worth in the prevention of epileptic convulsions and seem sufficiently devoid of harm.

In similar vein, we should not, as obstetricians, overlook the possible prophylactic value of adding the amino acid methionine to the diets of our preeclamptic patients, for this agent is likewise sufficiently harmless and is known to be of value in protecting the liver against a variety of insults.

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Discussion by CHARLES E. MCLENNAN, M.D., *San Francisco*

I wish first of all to commend Dr. Page for his extremely sensible physiologic approach to the problems posed by the patient with what we choose to call preeclampsia. Too long we have been endeavoring blindly to control or correct signs and symptoms without stopping to inquire into the basic mechanisms which are responsible for these aberrations from normality. Many medical schemes or systems of treatment for preeclampsia and eclampsia have come and gone with the years, but none has done much toward solving the underlying problem because these schemes have concerned themselves solely with reduction of the level of arterial pressure and/or the elimination of generalized edema.

When one begins to understand the physiologic reasons for such phenomena as retention of salt and water, widespread arteriolar spasm, proteinuria, urinary casts, oliguria, and epigastric pain, then he becomes somewhat less frightened by these cardinal signs of preeclampsia and is less likely to institute remedial measures which offer little hope of success or which may even do further damage by interfering with vital physiologic processes. The simple therapeutic measures suggested by Dr. Page, such as sedation, sodium restriction, use of ammonium chloride to eliminate the sodium ion, injection of hypertonic sugar solutions, and possibly digitalization, all have their place in the management of the mild and moderately severe instances of preeclampsia, and certainly in a majority of patients these measures will suffice. I am, however, somewhat skeptical about the virtues of using either serum albumin or the amino acid methionine. To be sure, methionine has been employed in certain types of liver disease, but one gathers from the internists that only indifferent success has been achieved.

Despite the obvious effectiveness of these so-called conservative measures, I would like to emphasize Dr. Page's final conclusion, namely, that removal of the cause of preeclampsia may be effected only by the termination of pregnancy. In the more fulminating cases this should be done promptly and, if necessary, by cesarean section. That is to say, when any other choice as to mode of delivery would necessarily involve the passage of an indefinite period of time, then cesarean section is chosen because it offers complete control of the time factor. In this regard, I would be interested in knowing whether Dr. Page believes that delivery by section, as he intimated early in this paper, always is contraindicated in the patient who has had a convulsive seizure. I have thought it somewhat illogical to abandon on such arbitrary grounds a therapeutic measure of real value (when properly executed under suitable types of anesthesia). Are there secure reasons for saying that it is perfectly legitimate to perform cesarean section now, when the patient in question is suffering from preeclampsia, but that the advent of one or two convulsive episodes within the following hour makes it mandatory that delivery be effected at all cost by some other and often less certain method? I think obstetrics has advanced to the point where we may bring this old textbook dictum into broad daylight and scrutinize the factual data upon which it is based.

Schneider's suggestion, based upon his experimental work with mice, that thromboplastin is the culprit in eclamptogenic toxemia is most intriguing but lacks confirmation. The very recent report by Maeck and Zilliacus (American Journal of Obstetrics and Gynecology, February, 1948) of results achieved in one patient treated with heparin seemed to me not particularly convincing, although it is only fair to say that Dr. Page's experience with heparin in a small series of patients has been at least moderately encouraging. Yet I am sure he would agree that the thromboplastin hypothesis has scarcely emerged from the realm of experimentation and any recommendation for the widespread use of heparin in preeclampsia would at this time be premature if not actually dangerous.

The Problem of Lupus Erythematosus

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SUMMARY

Lupus erythematosus is a challenging disease. Progress in our knowledge of it will come only from intensive research, but in the meantime the practicing dermatologist must be on the alert to make his own observations, to follow current literature carefully and welcome new discoveries from any reliable source. The disease is not the sole property of dermatology; we should rejoice at the interest of pathologists and internists in this condition and work closely with them.

LUPUS erythematosus is common in America, and though its clinical features are well known, the basic knowledge of either the acute or chronic forms has advanced but little since the disorder was first described late in the nineteenth century. The cause of the disease remains a mystery and an effective treatment has not been discovered. It is pertinent, then, briefly to review and reevaluate the known facts and to speculate on the direction in which to seek new knowledge.

Lupus erythematosus was described by such early dermatologists as von Hebra, Biett and Cazenave. A total of about 15 synonyms for the condition has appeared in the literature, all of which implied an erythematous lesion which progressed centrifugally and healed with a central atrophic scar. The acute form was likened to erysipelas by Kaposi. The chronic form was noted to have a number of morphologic variations, each of which was designated by a modifying adjective, while the severity of the systemic reaction was the basis for classifying the types of the acute variety.

The amount and degree of erythema, hyperkeratosis and atrophy were utilized in classification of the chronic form, while the presence or absence of fever was the chief criterion in appraising the acute form. Localization or dissemination of the lesions was also thought to be significant in the latter, not so much because of the number of lesions as because of the fact that systemic symptoms accompanied extensive eruptions. The well-known signs which differentiated acute from chronic inflammation in general were applied to the lesions of lupus erythematosus and were sufficient to make a quick distinction.

The following scheme of classification has been found valuable:

Form	*Type of Lesion*	
1. Chronic lupus erythematosus	1. Localized	a. Erythematous or congestive b. Edematous c. Papular d. Tumidus e. Hypertrophic verrucous f. Telangiectatic
	2. Disseminated	May have any of above characteristics — either one type or mixture
2. Sub-acute lupus erythematosus	1. Localized	
	2. Disseminated	
3. Acute lupus erythematosus	1. Disseminated accompanied by A. High fever (severe) B. Low fever (moderately severe) C. Absence of fever (mild)	

EVOLUTION

There is no characteristic primary lesion for any form of lupus erythematosus; what is looked upon as an early or first sign is in reality accentuation of an uncharacteristic beginning. Slight erythema and edema are probably the beginning phase of a lesion which soon assumes a diagnostic character, but a clinical diagnosis cannot be certain until erythema, follicular dilation, hyperkeratosis and even atrophy become apparent. Further evolution often reveals infiltration, telangiectasia and pigmentation. The variance in the degree of the characteristics mentioned determines the type of lesion, while the size, number and distribution of the lesions assist in evaluating the patient's condition.

All lesions of lupus erythematosus progress peripherally or centrifugally; thus the resulting outline is round, oval, or gyrate. Lesions may coalesce so that the outline is a composite of two or more lesions. The border and the zone just outside of the border is the more acute and newer portion of the lesion, hence is brighter in color. The actual border may have a darker tint while the center, especially if atrophy and scaling are present, has a gray appearance. The zones of a discoid lesion indicate the stage of the pathologic process. The appearance of the lesion is dependent upon the degree of hyperkeratosis and the depth is determined by the amount of edema and infiltrate which develops. It is not necessary to reiterate the variations in the types of chronic or fixed lesions. The type of lesion has no prognostic value but the behavior of the lesions has. As a rule the presence of a small number of lesions which progress slowly and become atrophic early indicates that the patient has the power to control

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the disease, whereas continued appearance of numerous new lesions on various parts of the body, particularly if they appear on areas other than the face, indicates poor resistance. Purely edematous lesions which enlarge rapidly direct attention to the general condition of the patient and may indicate danger of acute dissemination.

LOCALIZATION

All types of lesions of lupus erythematosus have a predilection for exposed parts of the body—regions which are subject to the effects of light, heat, cold and minor trauma. The nose, cheeks, chin, forehead, sides of the neck, the ears, upper sternal portion of the chest, intrascapular region, and back of the hands are areas involved most frequently in about the order mentioned. The so-called seborrheic areas are the sites of predilection for chronic lupus erythematosus. Strangely, the scalp is also a common location for lesions. The lips and buccal mucosa may be involved in a chronic case, while in an acute disseminated case, involvement of all visible mucous membranes is the rule. There is a rare, widely disseminated form of lupus erythematosus which has the appearance of psoriasis and a similar distribution.

ETIOLOGIC FACTORS

The fact that the lesions of lupus erythematosus occur on areas of the body exposed to light has emphasized what may be an erroneous concept; namely, that patients with lupus erythematosus are sensitive to light. Many such patients have definitely stated that exposure to sunlight aggravated or even precipitated the lesions. On the other hand other patients with chronic lupus erythematosus are outdoor workers, frequent bathing beaches, or indulge in outdoor sports, without any exacerbation of the condition. The first exposures in the spring in a northern climate seem to affect the patients most, but they soon become accustomed to the sunlight. It is true that histories of patients with the acute, disseminated form of the disease often reveal that the attack began with a prolonged, unaccustomed exposure to sunlight, but many acute cases occur without such exposure. An exposure to winter sunlight rarely precipitates an attack.

Porphyrin metabolism, exposures to and experiments with various wave lengths of the spectrum and the relationship of the condition to liver function, diet, and state of nutrition are just a few of the factors about which we need to know a great deal more before we can state unreservedly that the lesions or attacks of lupus erythematosus are aggravated by sunlight. It has been observed that the areas which are commonly attacked by lupus erythematosus have a tendency to local asphyxia under the influence of cold. This leads to a query regarding the ability of the blood vessels to react in patients with lupus erythematosus. Patients having the so-called chilblain type of circulation often have a tendency to arthritis. As in erythema multiforme, there seems to be a vague connection between these occurrences in lupus erythematosus, but there is no positive proof that the diseases belong to the same group.

A striking observation is the distinct increase in the incidence of lupus erythematosus in the months of spring and early summer. Freund[2] studied the general factors that influence lupus erythematosus. He critically examined the protocols of 383 female and 124 male patients seen in Arndt's clinic in Berlin and noted that the greatest number of cases occurred in the period March through July, while December was the month of lowest incidence.

Lupus erythematosus occurs most frequently from the second through the fourth decade. Few cases are seen in the first decade and the same holds true for people past 70 years of age. In my experience the few cases in children under 10 have all been acute or subacute in type. One child, five years of age, had a severe acute attack, the child hovering between life and death for many months. He was not seen again until he was 22 years of age. At that time he had an extensive but chronic form of lupus erythematosus.

Other climatic factors such as heat, cold, humidity and moisture may be of some importance, for lupus erythematosus is more common in the temperate zone than in the tropics. It appears to me, however, that, although external factors play some role in the localization and occurrence of this disease, they do not furnish much information as to its cause. Spitzer stated that season and climate exert a decided influence on the occurrence of lupus erythematosus, but whether this was in the negative or positive sense could not be stated. In Western Europe and America, cases of lupus erythematosus constitute no more than one per cent of the total number of skin cases in statistics collected by a number of dermatologists. There is considerable variation in the figures, some being as low as 0.3 per cent while none are over one per cent. It is interesting to note that in Breslau, lupus vulgaris occurred about four times as often as lupus erythematosus. Ehrmann and Falkenstein,[1] in 1922, carefully reviewed cases of lupus erythematosus observed in Austria. They remarked that about one quarter of all such cases recorded in Austria occurred in Vienna, and that there had been a great increase in the incidence of the disease both in its chronic and acute forms in the previous decade.

According to most observers the ratio of females to males with lupus erythematosus is about 3:1. This has led to speculation regarding an etiologic endocrine factor and, since the acute form is rarely encountered in males, drastic treatment directed at ovarian function has been undertaken in this form.

Pregnancy has an influence on some cases of lupus erythematosus; observers believe that it is a bad one in acute cases and advise therapeutic abortion. I observed one patient with acute lupus erythematosus, which began in the sixth month of pregnancy. Although extremely ill, the patient decided against an abortion, was delivered of a healthy child and recovered from the lupus erythematosus. She has been observed for 12 years and, although she has some chronic lesions on her cheeks, she has remained quite well. That some female patients with acute lupus erythematosus have been benefited by temporary suppression of ovarian function or by radical castration cannot be denied, but the procedure has not been successful in a large enough percentage of patients to warrant advocating it. The mechanism which brings about improvement when it occurs in such cases is not clear. I observed one female patient with extensive chronic discoid lupus erythematosus through two pregnancies. Each time the active lesions entirely disappeared, but new lesions developed about four months after delivery. Likewise, irradiation of gland-bearing areas, as advocated by Gennerich and practiced at one time by Goeckerman, has not been successful sufficiently often to be accepted as a standard procedure.

The cause of the disease remains obscure. At one time observers looked upon the various forms of lupus as forming a family of conditions. After the tubercle bacillus was discovered to be the cause of lupus vulgaris, it was assumed also to be the cause of lupus erythematosus. All the well-known methods of trying to establish a tuberculous cause were applied to this condition. In searching for the bacilli, animal inoculations and blood cultures were made, tissue extracts from excised lesions were searched for a tuberculin-like substance. Thorough postmortem examinations were made, especially in acute cases, and it was attempted to associate lupus erythematosus with lesions said to be tuberculous, such as tuberculosis adenitis and erythema induratum. In the voluminous literature on lupus erythematosus, some so-called proofs of tuberculous origin are to be found. Many observers, for example Keil, have avowed tuberculosis as the cause of lupus erythematosus. The subject must not be dismissed as closed, for some patients with the acute form of this disease have shown active tuberculosis at autopsy.

The pathologic studies of Klemperer and coworkers[3] have drawn attention away from the alterations that one would expect in tuberculosis; namely infiltration and necrosis, and have called attention to alterations in the collogen system. The widespread presence of these changes, especially in the skin, heart, kidneys and blood vessels, is in keeping with the generalized nature of the acute form of the disease, but still does not point out a cause.

PATHOLOGY

The pathologic changes of chronic discoid lupus erythematosus and the cutaneous changes in the acute form are certainly similar and make one unwilling to separate the two conditions into different diseases. This similarity, together with the fact that chronic cases have been known to become acute and, more rarely, that chronic lesions have persisted after a long, serious, acute attack, cannot be ignored. The great discrepancy between the severity of the two forms is hard to reconcile. How the chronic form may remain so inert and symptomless, while the acute is so severe and usually fatal, makes acceptance of unity almost insurmountable. The only common ground is a microscopic study of actual lesions. The pathologic changes of the more fixed type offer opportunity for extensive and thorough study. I have found it advisable to completely excise small, new lesions and have them cut serially in order to observe early changes. I have also excised some lesions which were in the erythematous or congestive stage. These studies, added to the examination of a great many routine excisions from chronic discoid lesions, have made it possible at least to describe the histologic differences observed.

The pathologic changes of the fixed type of lupus erythematosus are made up of three distinct processes: First, a vascular or perivascular disturbance, followed by edema and subsequent damage of connective tissue, followed by an infiltration and finally, epidermal and follicular alterations. The changes will depend, to be sure, to some degree on the type of lesion under consideration, and it must be emphasized that a uniform picture for lupus erythematosus does not exist.

The initial lesion seems to be a rather extensive, but irregular, dilation of the small blood vessels, noted particularly in the upper portion of the cutis. Edema goes hand in hand with this, separating the connective tissues. The edema has a very sharp line of demarcation in a horizontal plane and is most marked in the papillary portion of the cutis. The cutis below the horizontal boundary appears to be quite normal except for small foci of infiltrating small leukocytes. The epidermis may remain unaffected at first or show a variety of secondary changes. In the erythematous, transient type of lesion the changes are so slight and mostly edematous that it can readily be understood why such lesions may disappear without enough damage having been imparted to either the connective tissues or the epidermis to leave a scar. In the far more common type of chronic lesion, the vascular dilatation, edema and infiltrate become more marked, especially the infiltrate, and changes in the epidermis and connective tissues are severe enough to cause irreparable damage and therefore scar formation.

I am convinced that the papillary edema with a sharp horizontal boundary is an important first change. The infiltrate accumulates in various amounts forming masses of different shapes. Some are globular, appearing as round areas in the section, separated from each other, when deep, by nearly normal elements. In other specimens, the infiltrate seems to form large cubes so that the mass appears to be a square block in the section, often pushing up to or contiguous to the flattened epidermis. This is a common finding in an old discoid lesion. The infiltrate consists of small, darkly stained closely packed leukocytes. The cells are uniform in type, with an occasional larger, paler cell seen. Other types of cells, such as plasma, mast or giant cells are conspicuous by their absence. Such cells have been seen by some students of the subject but they certainly are not a common finding. Accumulations of red blood corpuscles are often seen in the infiltrate. The edema and infiltrate affect the connective tissue, or possibly the noxa of lupus erythematosus does so first. As aforementioned the collogen, especially in the papillary portion of the cutis, changes its affinity for the common dyes early and it appears swollen, drenched and pale and there is a decided separation with the formation of spaces. In the infiltrated areas the collogen completely disappears; the elastic fibers also are lost only to appear at the periphery of the infiltrate and in the non-infiltrated areas as heavy, broken bits, looking as though they had been stretched, torn and then snapped into condensed thick segments. This destruction of the connective tissue and the epidermal thinning account for the terminal atrophy.

The epidermis, disturbed by the edema, infiltrate and, I believe, change in cohesion, shows a variety of changes. The basal layer shows the effect of the underlying edema early. The individual cells become vacuolated and the nuclei, shrunken and misshaped, appear to float in the altered cells. The change is much like that seen in a mild dermatitis. The cell boundaries remain distinct, and although there must be a decided physiologic change in the cell, possibly a necrobiosis, I do not believe that there is true necrosis, for there is no ulceration. The basal outline changes, usually into a straight line. The epidermis is reduced to a few layers and there is some degree of hyperkeratosis. All the epidermal changes are not uniform; more marked in some areas than in others. The epidermal appendages may be lost, remnants being noticed in the dense infiltrate, or the epidermal change may be seen especially in the sebaceous follicle. Dilation and hyperkeratosis are most striking and the follicle may contain cornified debris.

To summarize: The pathologic changes of chronic lupus erythematosus are characterized chiefly by a variability of the degree of edema, infiltrate and epidermal atrophy. The process takes place in a fairly orderly manner in about the order mentioned. Although this is fairly diagnostic, one must constantly keep the process as a whole in mind and not base his opinion on too rigid a concept. In some instances, chronic lupus erythematosus may be readily recognized microscopically; in others the pathologic changes may be very hard to identify with the disease. The type and size of the lesion and the particular zone from which the tissue was taken should be known. It would be a mistake to state that the findings are pathognomonic.

No reports were found in the literature describing any findings in those organs commonly involved in the acute form of the disease in autopsies of patients who had chronic lupus erythematosus and died from some other cause. This constitutes a deficiency in our knowledge and I believe such studies would be of immense value in correlating the two extremes of this disease.

The microscopic anatomy of the skin in acute disseminated lupus erythematosus is well-known. Edema, infiltrate and atrophy are encountered in the skin of chronic discoid lupus erythematosus and in the acute form the process is similar but, as to be expected, much more rapid and intense. Edema and necrosis are the outstanding features. The edema again is in the upper portion of the cutis but so intense that bullae are often formed. The epidermis is separated from the cutis and it degenerates rapidly, forming crusts. Hemorrhage is often associated with the edema, and erythrocytes are seen in the infiltrate, which is not as dense or plentiful as in the chronic type. There is a decided similarity between the cutaneous pathology of the acute disseminated type and the chronic form, the outstanding difference being the intensity of the process in the former. Microscopic examination of the skin is of diagnostic help in obscure cases in which lupus erythematosus is suspected and, when all factors have been considered, is often confirmative.

For the pathologic findings in the internal organs we are indebted largely to the work of the Mount Sinai (New York) group. There, under the inspiration of Libman, Baehr, and Klemperer, our knowledge of this puzzling disease has been greatly advanced and the direction for further investigations has been suggested. I shall not review their many contributions but merely quote from Klemperer's most recent article. He states: "I believe that the present state of information permits us to conclude that acute lupus erythematosus is defined anatomically as a disease characterized by a fundamental alteration of the collogenous portions of the connective tissues. The exact nature of their alteration must be determined by investigation with the methods of histology, biochemistry and biophysics."

The internal organs most often involved are the heart, kidneys, spleen and serous membranes. The morbid anatomy includes fibrinoid metamorphosis of the collogenous fibers and local necrosis. The interpretation of the details of these findings are beyond my present knowledge and the reasons for their occurrence are still in a state of conjecture. Although the process suggests an infection, painstaking studies have not disclosed a bacterial cause. The leukopenia often present, the anemia, and more recently a new type of cellular inclusion found in marrow preparations, all point to an agent which affects the hemopoietic system.

Analysis of the findings in study of the cutaneous pathologic changes allows certain conclusions to be drawn. From the more or less constant picture seen, it would seem that tuberculosis may be excluded as the cause of the disease. The edema and infiltrate in themselves are comparable to pathologic changes provoked by infections and also by chemicals which are carried by the blood stream, such as bromine and arsphenamine. Since the chemical and microscopic findings in lupus erythematosus are so constant and characteristic, it would seem logical that we are dealing with an entity. The widespread damage in the acute form points to a blood-borne cause, and even in the fixed variety the pathologic process seems to have its origin from within.

The evidence that allergy plays a role in acute lupus erythematosus is not convincing. The endocrine factors, though startling, are not explanatory. The grave systemic nature of the disease is terrifying and the postmorten findings do not explain the death of the patient. Pathologic studies in themselves have about exhausted the searches for the cause of lupus erythematosus. The newer enzyme studies, a search for chemical and physical agents which may lay the groundwork for the pathologic process, as well as many other researches are necessary. We may have to wait for new methods of research not yet discovered, before the cause of lupus erythematosus can be found.

I shall not discuss diagnosis in this article. Chronic lupus erythematosus does not offer a great diagnostic problem. The differentiation between the acute disseminated form and dermatomyositis is at times very difficult and the conditions have much in common. Microscopic examination of excised muscle is positive in only approximately 20 per cent of cases of dermatomyositis and an adequate series of such excisions in acute lupus erythematosus patients is needed for comparison.

TREATMENT

There is no specific treatment for any form of lupus erythematosus. In fact, one might better state that there is no successful treatment for lupus erythematosus. In the chronic form, disappearance of the lesion or early scarring is the object of therapy. Localized lesions expected to disappear without a trace are few in number and of the congestive type. For them the internal use of gold or bismuth salts is usually employed, but since this type of lesion often spontaneously disappears it is doubtful if any therapy should be employed. External applications in this form of the disease should be avoided, for even the mildest ointment may cause irritation. No physical therapy is indicated.

In the more chronic discoid lesions, gold and bismuth salts are often used. It is doubtful if any benefit is derived from this treatment. There is often some initial improvement, but on the whole the results are disappointing. Such lesions will end in scars; hence to hasten scarring by the use of carbon dioxide snow seems sensible and is my treatment of choice. Protection from the sun's rays by means of chemicals incorporated in ointment bases helps some patients. Quinine is supposed to do likewise. Vitamin E and para-amino-benzoic acid or its sodium salt have recently been advocated. All in all, I am skeptical about the known remedies for chronic discoid lupus erythematosus, but I feel receptive to any new procedure that is worthy of trial.

The object of treatment in the acute form is to save the life of the patient. This calls for hospital treatment employing all the supportive measures known. Transfusions, intravenous fluids and feedings, judicious use of opiates, not sedatives, and the optimum degree of care on the part of the resident and nursing staff yield some satisfying results. The sulfonamides, penicillin, and streptomycin have not been effective. In fact, the sulfonamides may be contraindicated because some patients are made worse by their use. The treatment of acute disseminated lupus erythematosus is extremely disappointing and, although temporary improvement is noted and even rather long remissions occasionally are brought about, ultimate defeat with death of the patient is the most common outcome.

A large percentage of patients with chronic lupus erythematosus suffer little from their malady. The cosmetic appearance is to be deplored and cancer in lupo must be kept in mind, but dissemination is extremely rare.

The patient who has had evanescent facial lesions presents a special problem. Is he candidate for the acute form of the disease? In such cases, I believe that dissemination may be provoked and has been provoked by the use of ultraviolet radiation. One might speculate that dissemination was imminent and the therapy merely hastened the extension. However, it is difficult to explain the coincidence and I believe that the patient with lesions of the congestive type should be guarded from any possible therapeutic accident.

Patients with widely spread chronic psoriasiform lupus erythematosus are rare but present a great therapeutic problem. They are semi-invalids and do not respond to any known measures. Supportive measures, liver injections, local emollients and constant surveillance are the only suggestions.

Occurrence of periungual lesions is looked upon as a grave prognostic sign in our clinic. Edema, actual swelling and exudate with crust formation also are unfavorable changes in a fixed lesion.

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Rapid Healing of Peptic Ulcers in Patients Receiving Fresh Cabbage Juice

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SUMMARY

Thirteen patients with peptic ulcer were treated with fresh cabbage juice, which, experiments have indicated, contains an anti-peptic ulcer factor. This factor (vitamin U) prevents the development of histamin-induced peptic ulcers in guinea pigs.

The average crater healing time for seven of these patients who had duodenal ulcer was only 10.4 days, while the average time as reported in the literature, in 62 patients treated by standard therapy, was 37 days.

The average crater healing time for six patients with gastric ulcer treated with cabbage juice was only 7.3 days, compared with 42 days, as reported in the literature, for six patients treated by standard therapy.

The rapid healing of peptic ulcers observed radiologically and gastroscopically in 13 patients treated with fresh cabbage juice indicates that the anti-peptic ulcer dietary factor may play an important role in the genesis of peptic ulcer in man.

A RECENT series of experiments has demonstrated that an as yet unidentified food factor has completely prevented the development of histamin-induced peptic ulcers in guinea pigs.[2, 3] Experimental studies previously carried out showed that an "anti-gizzard erosion factor" would prevent the development of erosive lesions in chicks' stomachs when the birds were on a deficient diet;[1] and that this same factor, tentatively designated as Vitamin U, would prevent or modify the development of cinchophen-produced peptic ulcers in the stomachs of chicks.[4, 5] In 1936 Fauley and Ivy reported the prevention by diet of postoperatively induced jejunal ulcers in dogs.[8] The results of these animal studies dealing with the genesis and prevention of peptic ulcers raise the question of whether some dietary factor may not be involved in the formation of gastroduodenal ulcers in man.

During the period of World War II the use of a diet rich in this anti-peptic ulcer factor was applied to the treatment of soldiers in the Army.[6, 9] No "routine medications" were given. Several hundred patients were successfully treated with the diet but no proof that its efficiency was due to Vitamin U was established. If the resistance of the gastroduodenal mucosa to acid erosion and peptic digestion can be influenced in animals by a dietary factor, studies of its possible effect in man certainly require further observation, as the results obtained in treating soldiers were at least encouraging. As the guinea pig studies showed that both fresh whole cabbage leaves and cabbage juice were effective in completely preventing the formation of peptic ulcer in these animals, it seemed justifiable to try treating a series of peptic ulcer patients with cabbage juice.

SELECTION OF PATIENTS

It was decided that a preliminary or pilot study could best be carried out by observing ulcer crater "healing time" as described by Cummings and coworkers.[7] The expression "healing time" was used to designate the time interval between the original visualization of the crater by x-ray studies and subsequent non-visualization following a course of medical treatment. These investigators studied 63 cases of duodenal ulcer and six cases of gastric ulcer by this method. They found the average healing time for 62 of the patients with duodenal ulcer to be 37 days, with a range of 13 to 68 days. The average time in the six cases of gastric ulcer was 42 days with a range of 18 to 68 days. (See Figure 1.) All the patients received the same therapeutic regime which can be briefly described as "routine" and included hospital care, bland diet, frequent feedings of milk, alkalinization, antispasmodics, regular sedation and limitation of the use of tobacco. Pollard and co-workers have reported similar studies of gastric ulcer crater healing time with similar results.[10]

As these two series of cases of peptic ulcer which have been recorded in the medical literature establish the general trend of the healing time of craters in patients treated by the usually accepted methods of therapy, a small series of patients with peptic ulcer has been treated with cabbage juice so that the crater healing time might be compared with the "control" series from the literature. While such a comparison is not perfectly satisfactory, it seemed probable that any obvious deviation from the already recorded healing time might be considered significant.

Only patients with obvious peptic ulcer craters were selected for the present series. Crater size was

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classified by diameter as small (3-5 mm.), moderate (6-8 mm.), and large (9-21 mm.).[7] Treatment of seven patients with duodenal ulcer, five with gastric ulcer and one with gastrojejunal ulcers has been completed. Four are females and nine are males. They range in age from 26 years to 72 years (see Table 1.) Six were on the clinic ward of the Stanford University Medical School, five were from private practice, one was from the Veterans Administration Hospital in Oakland, and one was from the Indianapolis City Hospital Service of Eli Lilly and Company. The data relative to this last patient was furnished through the courtesy of Dr. Woodson C. Young. All patients were hospitalized throughout the period of experimental therapy.

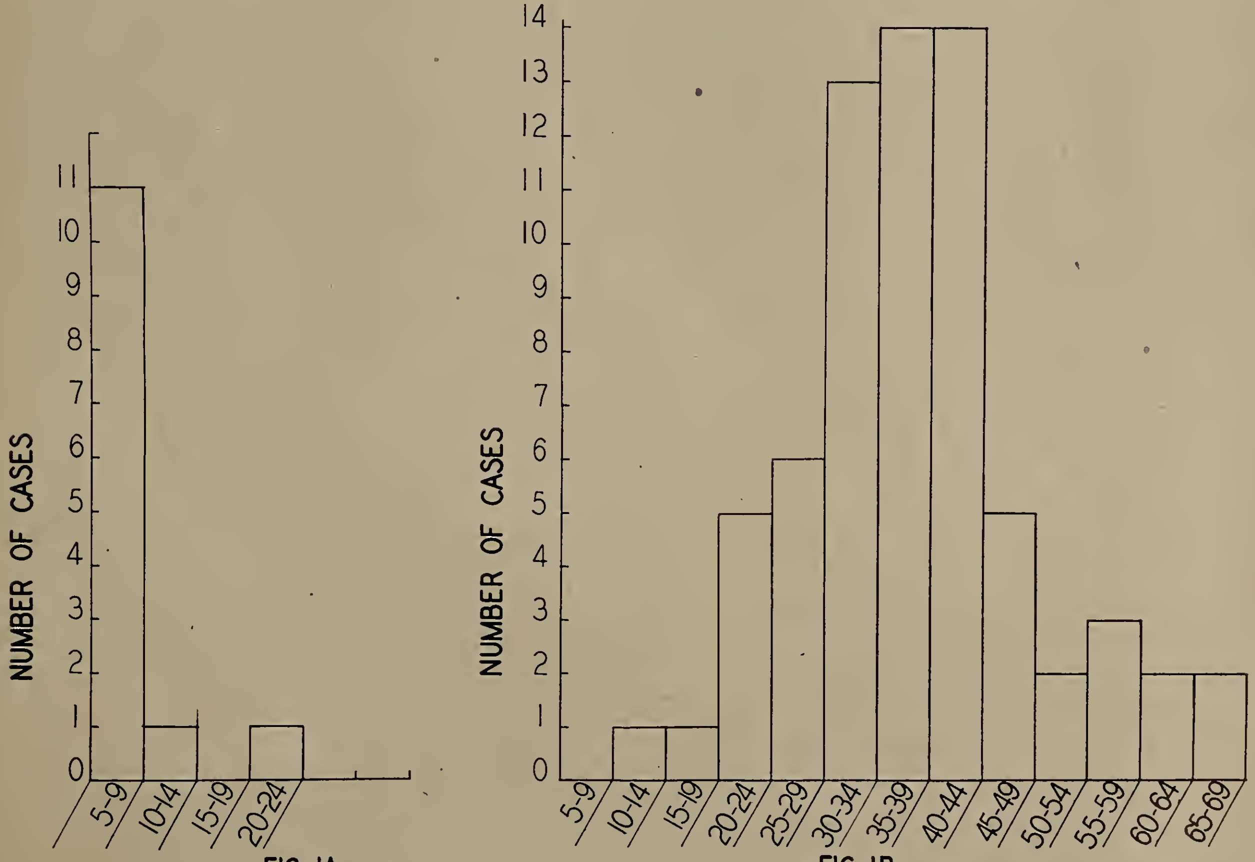
These patients were observed during the five months from July 1948 to November 1948, inclusive. They were selected basically because they had readily demonstrated ulcer craters, but a number of similar patients were rejected for experimental study because circumstances did not permit their following the complete therapeutic regime prescribed. No patients were rejected because they had ulcers that were "too bad" to treat medically. In fact, four patients (cases 4, 9, 10 and 13 in Table 1) were thought to have chronic duodenal lesions with scarring which might heal slowly and incompletely.

METHOD OF MANAGEMENT

All 13 patients with peptic ulcer in this series were studied by x-ray examination immediately prior to the beginning of experimental therapy and again after six to nine days of treatment. In two cases, 9 and 13, treatment was continued for 23 days and 14 days respectively, and the patients were then reexamined by x-ray. All patients were on bed rest until pain ceased, and then were permitted to be up and about as desired. No routine medications of any kind were permitted. However, patients were given bicarbonate of soda in 0.65 gm. doses or codeine sulphate in 0.065 gm. doses as indicated for abdominal pains, and mild sedatives at bedtime if needed for sleeplessness. Milk of magnesia was occasionally ordered to relieve constipation. All the patients were permitted to smoke as many cigarettes as desired but alcoholic beverages were forbidden.

All patients were placed on the following special diet:

Milk: Only cooked.
Eggs: Only with cooking.
Meats: Tender cuts—avoid pork, ham, bacon, and very fat meats.
Vegetables: All cooked. Peas, green beans, asparagus, tomatoes, carrots, beets, baby lima beans, artichoke hearts, squash.



- FIG IA-
-AVERAGE HEALING TIME IN DAYS-

- FIG IB-
-AVERAGE HEALING TIME IN DAYS-

HEALING TIME OF 13 CASES OF PEPTIC ULCER TREATED WITH FRESH CABBAGE JUICE (FIG IA) COMPARED TO 68 CASES FROM THE LITERATURE ON "STANDARD TREATMENT" (FIG IB)

Potatoes: Cooked as desired. Avoid fried. Rice, noodles, spaghetti, macaroni may be substituted.
Cereals and Bread: All white cereals and finely milled dark breads and cereals.
Fats: Butter in moderation. Lard in moderation.
Fruits: Cooked or canned—peaches, pears, apples, cherries, apricots, strained orange juice or tomato juice.
Desserts: Jello, puddings, simple pie, fruits listed above, cake, ices. Avoid ice cream.
Beverages: Coffee in moderation. Tea in moderation. Postum. Fruit juices of allowed fruits.
Condiments: In moderation.
Sweets: Sugar, honey, clear syrups, jelly. No seeds or skins. No nuts.
Only foods on diet to be served patient.
Patient may have as much of above foods as desired.
Nourishments between meals are allowed including ONLY *the foods listed above.*

The purpose of this diet was to eliminate all fresh and uncooked foods and to serve the patient only food which had been heated. This type of diet was ordered to eliminate possible food sources of the anti-peptic ulcer factor, which is readily destroyed by heating.[2, 5] Milk that had been heated only to the pasteurization point was not permitted, although recent animal experiments suggest that pasteurization destroys the anti-ulcer factor, at least in part. Patients were allowed food between meals as desired, in addition to three meals daily.

All patients were required to take at least a liter of fresh cabbage juice daily. This amount was based upon the fact that a minimum of 2 gm. of fresh cabbage leaves or 4 cc. of juice daily had been shown during the summer of 1948 to be 100 per cent protective against histamin-induced peptic ulcers in guinea pigs weighing approximately 300 gm. As 6 gm. of leaves or 12 cc. of juice daily would protect approximately one kilogram of guinea pig, it was calculated on the basis of relative body weight that the amount of juice necessary to adequately supply a 60-kilogram patient with the anti-peptic ulcer factor would be about 720 cc. To allow for variability in body weights of patients and for other unknown variables, it was felt that a patient should receive more than this amount of juice, so that a liter per day was chosen as the standard dose. Occasionally a patient would take as little as 500 or 600 cc. daily for one or two days until he became accustomed to this rather unusual beverage. One patient, case 10, consistently drank at least 1,200 cc. daily. A daily record of the total amount of juice drunk was kept throughout the period of the experiment.

No selection of cabbage heads was carried out. The usual hospital supply was utilized. Only green cabbage was used. The cabbages were noticeably pale in color during the fall months compared to those obtained during the spring and summer. All of the cabbage head was used. A juice press was employed to obtain clear cabbage juice. Usually about 2 kg. of cabbage was fed into the press to obtain 1,000 cc. of juice in an operation of about

TABLE 1.—*Effect of Fresh Cabbage Juice Therapy on the X-Ray Demonstration of Peptic Ulcer Craters in 13 Patients*

Case No.	Age and Sex	Duration of Present Symptoms	X-Ray Findings Before Treatment	Cabbage Juice Therapy No. of Days	Cabbage Juice Therapy Total Amt.	Days Before Symptoms Subsided	X-Ray Findings After Treatment
1*	54 F	2 mos.	Small gastrojejunal ulcer crater	7	7,000 cc.	3	No lesion found
2*	67 F	2 wks.	Small lesser curvature gastric ulcer crater	7	7,000 cc.	4	No lesion found
3	34 M	1 mo.	Moderate size postbulbar duodenal ulcer crater	7	7,000 cc.	3	No signs of ulcer
4	36 M	1 mo.	Large duodenal cap crater	6	5,500 cc.	2	No signs of ulcer
5	42 M	1 mo.	Large duodenal ulcer crater	8	8,000 cc.	3	No lesion found
6*	57 M	6 wks.	Small lesser curvature gastric ulcer crater	9	9,000 cc.	Asymptomatic time of therapy	No evidence of ulcer crater
7	53 M	3 mos.	Moderate sized duodenal ulcer crater	7	7,000 cc.	Asymptomatic time of therapy	No lesion found
8*	45 M	3 wks.	Large lesser curvature gastric ulcer	7	7,000 cc.	4	No lesion found
9	52 F	6 mos.	Large duodenal ulcer crater and cap deformity	8	6,000 cc.	2	Crater one-half former size
				23	13,500 cc.		No crater seen
10	72 M	2 mos.	Large duodenal ulcer crater and cap deformity	8	12,800 cc.	3	No crater found; cap deformity persists
11*	26 F	6 mos.	Small lesser curvature gastric ulcer	9	7,800 cc.	4	No lesion found
12*	40 M	6 wks.	Small prepyloric ulcer crater	6	6,000 cc.	Asymptomatic time of therapy	No sign of ulcer
13	52 M	2 mos.	Large postbulbar ulcer crater	9	8,000 cc.	6	Small ulcer crater persists
				14	13,000 cc.		No crater demonstrated

*Gastroscopic examination carried out before and after therapy.

20 minutes' duration, although a considerably higher yield of fluid could be obtained if small amounts of cabbage were fed into the press very slowly. As a rule fresh juice was prepared for each patient twice daily, at 10 a.m. and 2 p.m. As the addition of celery juice made the beverage more palatable, and it had been found to contain the anti-peptic ulcer factor, three of the last four patients treated received a mixture of 75 per cent cabbage juice and 25 per cent fresh celery (stalk and greens) juice.

All the patients except one not included in this series were able to take the cabbage juice successfully for the duration of the experiment. The total amount of juice received by each patient is shown in Table 1. About one-third of the patients developed mild abdominal distress and some constipation the second or third day of juice administration. These symptoms were relieved by giving milk of magnesia. Two patients omitted the cabbage juice for one day each while these symptoms were occurring. The juice was given to the patients in 200 cc. amounts five times a day. It was served about 10:30 a.m., at lunch, in mid-afternoon, at supper and in the early evening. It was kept in the ice box and served, well chilled, directly to the patient. Juice kept overnight was not palatable. Seasoning with salt and pepper and an addition of tomato juice was encouraged, as was the ingestion of crackers or other food along with the cabbage juice. It was not necessary to tube-feed the juice to any of the patients.

In addition to the x-ray examinations carried out to evaluate the results of cabbage juice therapy, gastroscopic examinations were performed, before and after treatment, on all of the six patients with gastric lesions. All of the gastroscopic studies with one exception were carried out by a single gastroscopist, Dr. Hugh Rose, Jr. The day that pain ceased was noted for each patient (see Table 1). A gastric analysis was performed in each case as part of the initial case study. Follow-up case studies were not carried out.

RESULTS OF EXPERIMENTAL THERAPY

Table 1 shows clearly the results obtained in treating 13 peptic ulcer patients with fresh cabbage juice. All showed rapid improvement, as measured by x-ray studies of crater healing time. In 11 of the 13 cases the craters disappeared within six to nine days. No cases were recorded by Cummings and co-workers[7] as healing this rapidly. A comparison of results in their cases with those in ours is shown graphically in Figure 1. In one patient in our series, case 13, the crater took 14 days to "heal" (see Figure 2), and in one, case 9, 23 days. In both instances the healing time was much shorter than the average of 37 days reported in the literature. The average healing time for the seven cases of duodenal ulcer treated with cabbage juice was 10.4 days, compared with 37 days in cases from the literature. The average healing time for the six cases of gastric ulcer, including the patient with marginal ulcers, was only 7.3 days, compared with 42 days for those from the literature. The average healing time for the total of 13 cases of peptic ulcer treated with cabbage juice was nine days.

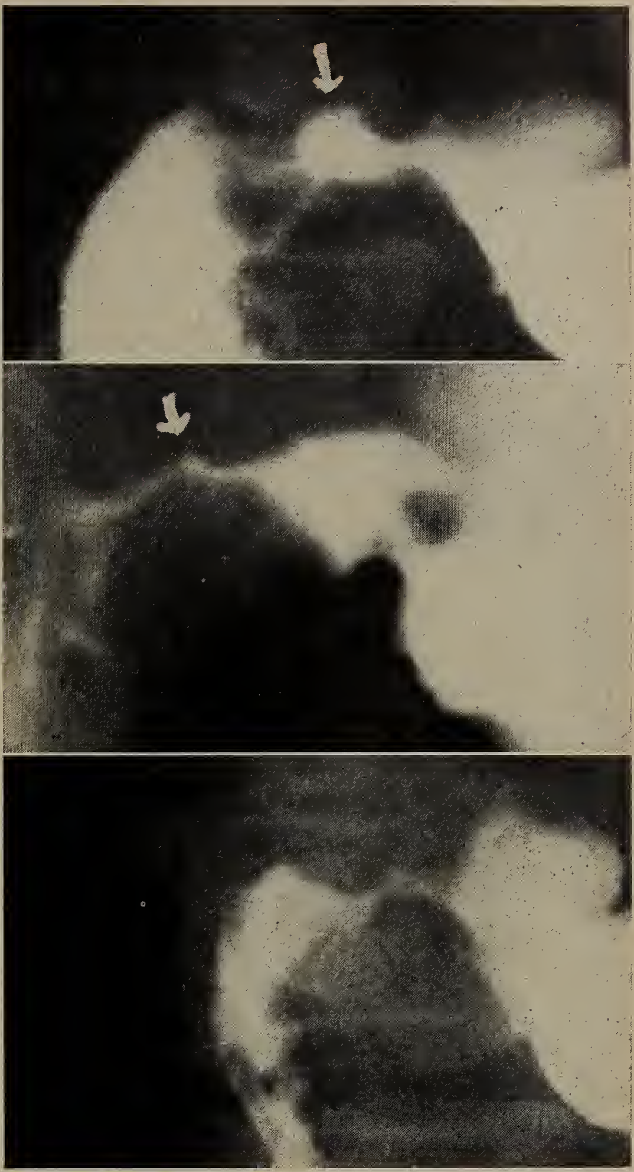


Figure 2.—Rapid healing of a large duodenal ulcer during the administration of fresh cabbage juice. (Top)—Large postbulbar crater before treatment. (Middle)—Marked reduction in size of crater after nine days of therapy. (Bottom)—Disappearance of crater after fourteen days of therapy.

The results of gastroscopic examination proved even more dramatic in the six cases of gastric ulcers than the x-ray demonstration of rapid crater healing. In two of these patients, case 1 with three small gastrojejunal ulcers visualized through the gastroscope and case 11 in which two small gastric ulcers were seen on the lesser curvature of the stomach, the lesions appeared to be completely healed at the time of the second gastroscopic examination which followed treatment. In the other four cases typical healing lesions could still be identified after treatment but crater depression was either not discernible or so slight as to be almost indistinguishable. In Figure 3 a reproduction of the x-ray films of case 6

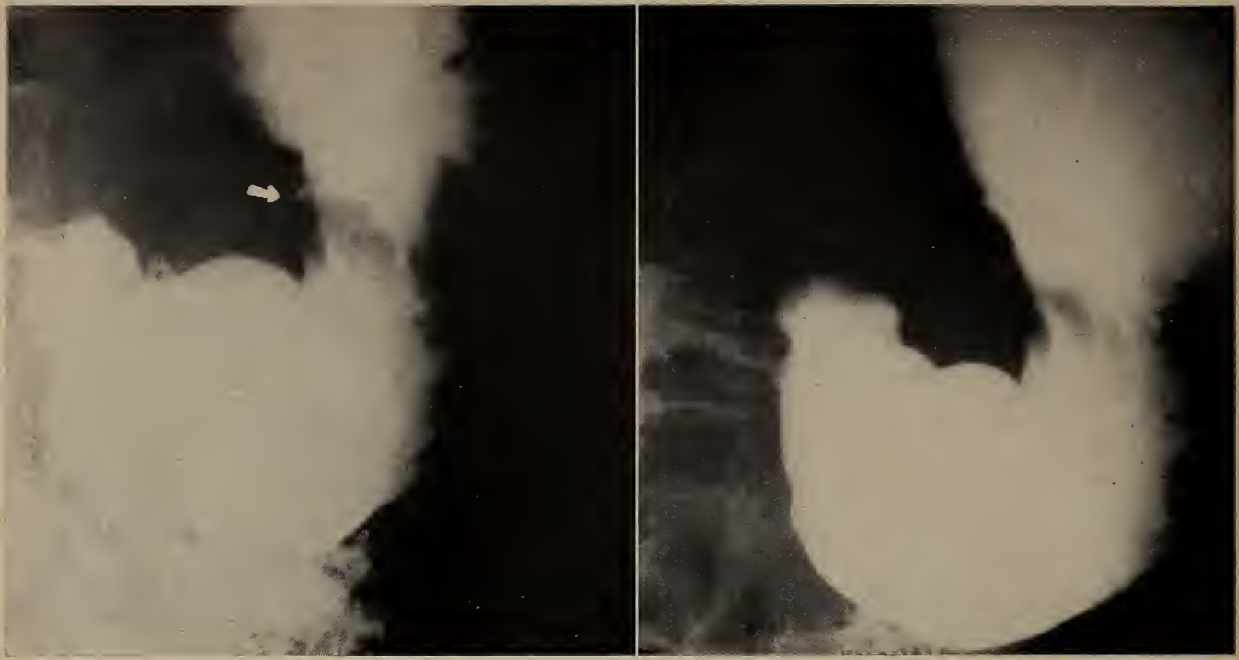


Figure 3.—Rapid healing of a small lesser curvature gastric ulcer. (Left)—Appearance of crater before cabbage juice therapy. (Right)—Disappearance of crater after nine days of therapy.

shows the presence of a gastric ulcer crater before treatment with cabbage juice and its absence after treatment. In this case the ulcer niche had persisted for six weeks without appreciable change while the patient was receiving a "standard type" of peptic ulcer regime. The gastroscopic examinations of this patient, as was the case with the other patients with gastric ulcers, not only confirmed the appearance of the crater as outlined by the x-ray films before the institution of therapy, but also demonstrated that after he had received 9,000 cc. of cabbage juice over a nine-day period, the crater had filled in nicely as part of the healing process of the peptic ulcer.

SIGNIFICANCE OF THE RESULTS OBTAINED

The rapid healing of peptic ulcer craters in 13 patients receiving fresh cabbage juice therapy is not considered adequate proof that cabbage contains an unidentified factor (Vitamin U) which apparently plays a specific role in healing of peptic ulcers. However, it indicates that such may be the case. The results in this small series of cases are sufficiently encouraging to warrant treating a large group of carefully controlled patients with the anti-ulcer factor. At present such a study must be purely on an experimental basis.

It is important to note that the cabbage is not the sole source of the anti-ulcer factor. It has been shown experimentally that it is present in varying concentration in a variety of fresh greens and cereal grasses as well as fresh milk, raw egg yolks, certain animal and vegetable fats and gastric mucosa.[2, 3, 4, 5] It has not been identified as any one of the known vitamins or any food factor which has been isolated. Large doses of ascorbic acid are protective against histamin-induced peptic ulcers in guinea pigs,[3] but the relationship of Vitamin C and Vitamin U in this respect has not yet been worked out. Vitamin C is water soluble while Vitamin U is fat soluble.

The fact that the anti-peptic ulcer factor is readily destroyed by heat indicates that the preparation of food for human consumption by heating or cooking may completely destroy this factor. If this is so, it may become necessary to include certain raw foods in the diet of peptic ulcer patients, not only to promote the healing of ulcers which have already formed, but to prevent the development of lesions in the future. At present pasteurized or even raw milk cannot be relied upon alone to accomplish this purpose. Experimental studies which are going on at present strongly indicate that fresh greens, milk and eggs contain a great deal less of the anti-ulcer factor in the fall in California than they did in the spring and summer. It is noteworthy that there is a high seasonal incidence of peptic ulcer symptoms in the late fall in northern California.

Up to the present no extract or concentrate containing Vitamin U has been developed for clinical trial. However, during November 1948 a concentrate of cabbage fat* has completely protected ten guinea pigs from histamin-induced peptic ulcers when it was fed at the level of 100 mg. per day to a 300 gm. animal.

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*Supplied by Viobin Corporation of Monticello, Illinois.

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Hemostasis With Absorbable Material in Operations on the Foot

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The smaller an operative wound area, the more difficult the control of capillary bleeding. Oozing of blood from cancellous bone after resection of an exostosis or partial removal of the condyle of a phalanx of a metatarsal bone has always been a difficult problem in operations on the foot. A similar problem is encountered in operations on soft tissues and in dissection of loose pieces of bone from connective tissue. The bleeding not only interferes with the surgeon's view, but forms tiny pools which hamper wound healing.

The bleeding capillaries may be too small to be caught and ligated, and if the oozing originates from cancellous bone the capillaries may be inaccessible for clamping and ligation. Pressure applied to the bleeding surface may help somewhat, and a pressure bandage after the wound is closed may control the minute hemorrhage. But these measures have only limited value; and, as to a compression bandage over a dressing, there is the disadvantage that it may become too tight and cause pain.

Oxidized cellulose gauze and absorbable gelatin sponges offer a very welcome solution to the problem. Either of these substances may be placed in the wound to stop bleeding and left there to be absorbed eventually by the tissues.

TECHNIQUE

A pledget of the proper size is cut from the material in bulk, placed on the bleeding surface and pressed down by the gloved finger covered with sterile gauze. It will stick to the wound and absorb the oozing blood. Left in place and the wound closed over it, it will gradually be absorbed and disappear from the tissues.

In cases in which it is desirable to put thrombin or penicillin into the wound, this may be done by immersing the gelatin sponge pledget in a solution of either or both of these drugs before it is pressed into place and the wound closed over it. The thrombin solution used by the author is made by dissolving 1,500 units of thrombin powder in 15 cc. of normal saline solution. If an antibiotic is indicated, penicillin is added, 200 units or more to each cubic centimeter of the thrombin-saline solution.

The author has used oxidized cellulose gauze and absorbable gelatin sponges, in the manner described, in bunionectomy, arthrectomy, sesamoidectomy, calcaneal exostotomy and a variety of other operative procedures on the foot. In no case was delay in wound healing or other complication encountered.

SUMMARY

Oxidized cellulose gauze and absorbable gelatin sponges may be pressed into small operative wounds in the foot to control capillary ooze of blood that otherwise presents difficulties in such procedures.

The material may be left in place to be absorbed by the surrounding tissues after the wound is closed over it.

Pledgets of gelatin sponge soaked in solutions of thrombin or penicillin or both may be used to hold these drugs within a wound if use of them is indicated.

727 West Seventh Street.

Poliomyelitis in Pregnancy

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SUMMARY

Acute poliomyelitis occurs in all trimesters of pregnancy. At one time there were six women in the poliomyelitis ward at Children's Hospital, five of whom were either pregnant or recently delivered. Poliomyelitis is an important entity in the differential diagnosis of diseases complicating pregnancy. Once diagnosed, treatment is directed primarily toward the symptoms of poliomyelitis, secondarily toward pregnancy. Effort should be made to maintain adequately high oxygen tension in the maternal blood stream to protect the fetus. The prognosis of the disease when it occurs during pregnancy may be less predictable, but it is generally good for both mother and infant. Although the incidence of abortion is relatively high, if the pregnancy goes to term parturition is expected to be normal. The number of cases reported is not sufficient to establish the significance of the suspected selective occurrence of poliomyelitis in pregnancy.

EIGHTEEN women with acute anterior poliomyelitis complicating pregnancy have been treated in the communicable disease department of Children's Hospital in the past several years, during a period when approximately 500 patients with poliomyelitis have been admitted. The ages of these pregnant women varied between 17 and 33 years, and the duration of gestation at the time of onset of poliomyelitis was between six weeks and 36 weeks. Determination of the length of gestation was based on history, physical examination, biologic assays and, in the cases of abortion, on the tissue expelled from the uterus. Diagnosis of the acute anterior poliomyelitis was based on history, physical examination and on examinations of the spinal fluid. Spinal punctures were done routinely except in a few cases in which paralysis was progressing rapidly or when the patient was convalescent on admission.

Seven of these women were admitted with acute poliomyelitis during the first trimester. Of this group a total of three patients aborted spontaneously and three carried their babies to term. The seventh patient, who was admitted to the hospital practically convalescent, had intermittent bleeding from the fifth month on and was delivered in the eighth month of a premature infant which died. Labor was complicated by hemorrhage due to placenta previa. No fetal anomalies were noted. One patient with non-paralytic acute poliomyelitis, whose neck stiffness was mild and associated with low grade fever and a positive spinal fluid characteristic of poliomyelitis, aborted in the third week of illness, which was the twelfth week of pregnancy. No virus was isolated from the fetus. Four of the patients were discharged with diagnoses of acute paralytic anterior poliomyelitis. Two carried their babies to term and delivered normal infants uneventfully. One patient whose involvement was both bulbar and spinal had no apparent difficulty with her pregnancy. None of these patients was delivered during the period of hospitalization. All the patients who aborted in the acute phase of poliomyelitis showed accelerated recovery after the abortions occurred, but the outcome was good in the other three cases. Only one has residual palsies which are incapacitating.

There were seven patients admitted during the second trimester of pregnancy and diagnosed as having acute anterior poliomyelitis. One of these was non-paralytic, four showed paralyses of spinal origin and two had both spinal and bulbar involvement. An unusual complication occurred in one of these women in the fifth week of illness, when phlebothrombosis developed in the left leg. It was treated by ligation of the femoral vein and removal of the thrombus. Five of these women had full term babies delivered either spontaneously or with elective low forceps after easy, effective and relatively short labor. One delivery was complicated by acute gastric dilatation during the second stage. The stomach was decompressed while the patient was still in the delivery room and dilatation did not recur. This same patient also had a subinvoluted uterus six weeks postpartum and was treated successfuly with a short course of ergotrate. The sixth patient delivered normal twins in the eighth month. Labor was uncomplicated and short and the deliveries were spontaneous. She was dismissed from the hospital when the babies were two months old and was able to care for them after one year.

The patient in whom poliomyelitis occurred earliest in the second trimester and in whom the involvement was extensive was transferred to our hospital, after termination of the pregnancy, with extensive paralysis of four extremities, the trunk and muscles of respiration. Abortion had been done in the fourth week of illness, while the patient was still in the respirator, by the insertion of an intra-uterine catheter. This caused such profuse hemorrhage that two transfusions of blood were necessary. Although the

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patient progressed slowly, and without appreciable acceleration after the abortion, recovery was almost complete at the end of one year, except for residual effects in one arm. This group of patients as a whole had more paralysis, slower recovery and more numerous residual effects than did the women affected in the first trimester.

Four women contracted acute poliomyelitis in the third trimester. One died. She had acquired acute paralytic poliomyelitis at the beginning of the seventh month and had extensive involvement of the cranial nerves, the muscles of respiration, back and upper extremities. The course was complicated by pneumonia and pyelonephritis and she died on the twenty-third hospital day. A postmortem cesarean section was done, but the infant was stillborn. Autopsy findings showed acute anterior poliomyelitis and pyelonephritis in the mother, but no significant pathologic changes were found in the baby. Of the other three patients admitted during the last trimester of pregnancy, two had non-paralytic acute poliomyelitis, recovered rapidy and delivered normal infants. The third was in the prodromal stage of poliomyelitis at the time of labor and delivery, neither of which was unusual. The diagnosis was made on the third postpartum day and was confirmed by spinal fluid examination and appearance of typical and extensive paralysis. The baby did not thrive, showed equivocal neurological signs, and the spinal fluid cell count was nine. Improvement followed a transfusion with whole blood and the baby was discharged from the hospital well, with a discharge diagnosis of possible acute poliomyelitis.

All the women had fairly characteristic preparalytic symptoms, although these were often mild. Influenza was a confusing differential diagnosis in this stage. The early symptoms in two cases led to a diagnosis of hyperemesis gravidarum and the early myalgias were attributed in several instances to the polyneuridites so often seen in pregnancy. Frequently, then, the first neurological signs, such as stiff neck and back, were not detected and the diagnosis of acute poliomyelitis was delayed until typical paralysis developed. Ten of these women had pyuria, difficulty in voiding, and required catheterization either in the preparalytic or paralytic stage. In three cases bladder symptoms preceded any others.

MANAGEMENT

There is no specific treatment of acute poliomyelitis. Human pooled serum or other blood products, although of questionable value, were often given at the early stage. The infection was treated first, the pregnancy considered second. Kenny packs were started immediately and physical therapy employed to the extent permitted by pain and spasm. Chemotherapy was used prophylactically when repeated catheterization was necessary and for treatment of urinary tract infections. Threatened or concurrent pneumonia was treated with penicillin. Supplemental protein, carbohydrate, electrolytes, vitamins and minerals were given orally or intravenously in quantities sufficient to care for the increased demands of pregnancy. Artificial interruption of pregnancy was not carried out in our hospital, for we believe it is contraindicated since the blood loss and sudden change in metabolism decrease the resistance of the patient.[7] Two reports were found in the literature in which the authors expressed belief that early termination was indicated for their patients, in one instance to relieve respiratory embarrassment which was increased by the presence of the near term infant, and in the second in a case of severe cystitis in which recovery was prevented by mechanical obstruction.[11] Excessive blood loss after incomplete abortion was prevented by prompt curettage. Oxygen, by nasal catheter or respirator, was provided generously in cases of respiratory embarrassment. Because of the increased demands of pregnancy, and to insure adequately oxygenated blood for the fetus, this was often resorted to when there was little evidence of maternal anoxia. In one instance fetal well-being was considered primarily.

Our series indicates that the acute anterior poliomyelitis has little effect on pregnancy and that normal labor and normal offspring may be anticipated if abortion does not occur during the first trimester. In our 18 cases, 15 babies were delivered to 14 women. Thirteen of the infants, nine males and four females, survived. One premature female expired and one male was stillborn. The findings in our small series do not further the postulation once submitted by Aycock that all mothers who contracted poliomyelitis in the first trimester delivered boys, those who acquired it in the last trimester, girls. Successful outcome of the pregnancy after the first trimester was also the clinical experience of Kleinberg,[10] Aycock,[2] Miller,[12] and others, but in all reported series, totalling about one hundred cases, the incidence of abortion is relatively high, being about 35 per cent. In our series, it was 27.8 per cent.

The assumption that labor will be normal is substantiated by physiological experiments which show that the uterus will contract and expel the products of conception after the spinal cord has been divided and after the sympathetic nerve supply has been destroyed. It is concluded, therefore, that the uterus has its own intrinsic nerve supply which stimulates contractions.[11, 13] Clinically the labor is easy, less painful and shorter than in normal women of comparative parity. The size and shape of the pelvis, the distortions produced by paralysis, the cephalopelvic relationships and the general condition of the woman must be evaluated just as for the normal patient. The indications for operative delivery are about the same as those for non-paralytic women. "Undoubtedly more cesarean sections have been performed on paralyzed women than have been warranted. The complications prior to and following delivery are on the percentage basis almost identical with those in non-paralytic women."[8]

There seems to be no clinical or experimental evidence that the virus is transmitted to the fetus *in utero* or through the breast milk.[9, 13] Our case in which there was diagnosis of possible infection in a newborn and the few reported indicate that the contact is at the time of birth or after.[5]

EFFECT OF PREGNANCY ON POLIOMYELITIS

The effect of the pregnancy on the course of the poliomyelitis and on the extent of paralysis has not, on the other hand, been so clearly demonstrated. Some authors feel that pregnancy is a factor which definitely affects the severity and ultimate outcome, but the observers who reported the 30 cases of poliomyelitis in pregnant women during the 1946 epidemic in Minnesota expressed the belief that pregnancy does not alter the disease process.[4] In our series, those patients who aborted in the early months seemed to progress more favorably. Although the progress seemed slower in those women who carried their babies to term, the slowness was often due to the impediment of the pregnancy on muscle reeducation and physiotherapy. All had good outcome after delivery, considering their more extensive palsies.

There seems to be an increased susceptibility of the pregnant woman to anterior poliomyelitis, and this may be related to the seemingly greater severity of the disease in pregnancy.[11] It is now believed that the virus of poliomyelitis is more or less uniformly disseminated. At least in epidemics the virus is more widespread than the occurrence of the disease would indicate and the likelihood of acquiring infection is probably conditioned quite as much by factors which influence whole susceptibility as by those which bring about exposure. The occurrence of poliomyelitis following operations on the nose and throat suggested that mucous membrane changes affect susceptibility. This, together with the implications that the upper respiratory mucosa may be the portal of entry, led Aycock to the premise that mucosal alterations due to estrogenic changes during pregnancy might account for the frequency of poliomyelitis during gestation.[2, 3] He and other observers have investigated the estrogenic variations during pregnancy, in experimental animals and in women with poliomyelitis, in efforts to explain the special susceptibility, but the results have been not only equivocal but controversial.[2] The other hormones of pregnancy were also investigated and Jungeblat and Weaver did find that chorionic gonadotropin or some substance involved in its formation or metabolism, in experimental animals, increased the resistance of the pregnant female in the first trimester. The fact that the chorionic gonadotropin increases tremendously in the first few weeks and levels off after the first trimester, and that, experimentally and clinically, the greatest number of cases occurred in the last two trimesters would add evidence to this assumption.[13] There was an equal number of cases in each of the first two trimesters in our series, but the severity of the disease was less in the group involved in the first three months.

It is well known that pregnancy affects the development of other diseases either favorably or unfavorably, and it is our opinion that there are more likely to be many factors resulting from the great change in physiological processes during pregnancy which would predispose to poliomyelitis. In common with other conditions where increased fatigability and recovery time seem to figure in susceptibility to virus infection, so do they in pregnancy. Added nutritional demands, changes in mineral and vitamin balance, the great stress on all the organs of the body, especially the liver (in estrogen metabolism[6] as in all its functions), increased blood volume and dilution, decreased hemoglobin, serum proteins and non-protein nitrogens are only a few of the physiologic variations which suggest more than endocrine changes as factors in the increased susceptibility to poliomyelitis during pregnancy.

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Anesthetic Morbidity

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SUMMARY

Anesthesia entails some risk of morbidity. This morbidity can be minimized by adequate preoperative preparation of the patient, by judicious selection and proper administration of anesthetic agents and by proper care in the early postoperative period.

Properties of various anesthetic agents are discussed with regard to their systemic effects, with emphasis upon the effect on patients with impaired function of internal organs.

PATIENT morbidity resulting from the administration of anesthetic agents is a condition which in the past has received too little consideration on the part of all concerned. One reason for this lack of consideration is probably that we have no means of determining just how much of the physiological change seen in postoperative patients is due to the operation and how much to the anesthetic procedure—the agent used, the method in which it is used and the way in which the various agents are combined in order to have the least deleterious effect upon the patient.

From an anesthetic standpoint each patient is an individual and must be treated as such. It is no more logical for the anesthetist to confine his procedure to one agent than it is for the clinician to confine his treatment to a single drug. Too often the judgment of success or failure of an anesthetic agent is based solely upon the mortality experience, with the result that an agent may be used with total disregard for the morbidity which it causes. The reason for this is probably that mortality is a concrete entity which can be measured and tabulated, while morbidity is abstract. If, however, there could be a method of tabulating anesthetic morbidity, the results probably would be quite surprising.

All anesthetic agents produce physiological changes in the patient, the amount and duration being dependent upon several factors. Some of these factors are: concentration of the agent, duration of time the patient is exposed, emotional status of the patient, physical condition, and pre-existing disease. Thus, keeping the patient morbidity at a minimum requires in many instances a thorough study of the individual patient before a satisfactory choice of anesthetic agent or agents can be made.

Often in reviewing the chart of a patient before operation we see the entry "O.K. for anesthesia." This is, to say the least, misleading. Does "O.K." mean that the patient can take an anesthetic with impunity or does it mean that he will barely survive? For what type of anesthesia is he "O.K."? To what plane of anesthesia can he safely be carried and for how long? These are facts which we should try to determine beforehand if we are to do justice to the patient. For example, a patient with a history of a recent coronary attack who is to have cholecystectomy might safely be given a light inhalation anesthetic combined with curare for a moderate length of time, but what would be the effect if a high spinal anesthetic were used and there ensued a tremendous drop in blood pressure which lasted several minutes? The latter would certainly have some effect on morbidity to say nothing of mortality.

PREOPERATIVE MEDICATION

By judicious use of preoperative medication much can be done to reduce postoperative morbidity. Mistakes in premedication are of two types; namely, too little and too much. With too little the patient is not spared emotional trauma as he should be; with too much he is returned to his room in a depressed condition, in which he remains for several hours. The sooner a patient can become mentally alert and physically active following an anesthetic the less will be the anesthetic morbidity. In this regard the intravenous route for preoperative medication has much in its favor. Many patients are brought to the operating room vomiting as a result of sensitivity to opiates. If an opiate is given intravenously, slowly and in dilute solution, sensitivity may be noted immediately and before a sufficient amount has been given to distress the patient more than temporarily. Moreover, the effect is immediate and the administration can be stopped when the desired effect is reached—an important consideration, since some patients require less of an opiate than do others. A third argument in favor of the intravenous route of administration is that, when given intravenously, most drugs, especially barbiturates, seem to be more rapidly eliminated. Thus the patient is alert sooner after operation although during the procedure the effect is as profound as though the drug were given extravenously.

ANESTHETIC AGENTS

Only those anesthetic agents which are better known or most commonly used will be considered in this presentation. According to Myerson and Loman, ether causes an increase in intracranial pressure as well as an increase in venous pressure as measured in the jugular vein.[2] It also causes dilatation of the cerebral vessels. Although these facts do

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not contraindicate its use they should be borne in mind in those cases in which it is desirable that the intracranial pressure remain at a minimum. Ether also has the property of depressing the respiratory center as well as that of rendering the center less sensitive to normal respiratory stimuli — namely, CO_2 and stimuli from the respiratory passages.[4] Thus, once the center is severely depressed, resuscitation by the usual methods may be more difficult than if the depression were caused by some other agent.

Anesthetic agents have a definite influence on body temperature.[1] This influence is usually negligible but in young individuals under hot, humid conditions it has resulted in death. It is, therefore, a factor to be kept in mind in such conditions.

Liver damage produced by the various anesthetic agents is largely dependent upon the glycogen content of that organ. The chief factors which influence glycogen content are pre-existing liver diseases, nutritional disturbances which do not necessarily involve the liver, and anoxia. As is well known, chloroform is the agent most likely to produce permanent liver damage. This finding has been so consistent that chloroform has come to be contraindicated for all conditions, regardless of age, length of anesthesia or preoperative condition. Ether likewise is capable of producing serious liver damage, especially in the presence of anoxia. It is thought that many of the violent postoperative reactions following the use of ether are the result of liver damage. With the use of chloroform, one hour of anesthesia reduces the glycogen content of the liver 25 per cent while during the same interval the blood sugar content is increased by 200 per cent.[3] Ether in the same period of time reduces liver glycogen 50 per cent and causes an increase in blood sugar of from 100 to 200 per cent.[6] This change may be partially prevented by increasing the glycogen content of the system preoperatively.

The liver changes resulting from the use of the longer acting barbiturates are closely akin to those changes encountered following infectious diseases. These are usually transitory in nature. It is thought that the shorter acting barbiturates are largely excreted by the liver while those of longer duration are excreted through the kidneys. Although it is not definitely proven, the increase in the length of time required for some patients to recover from moderate barbiturate anesthesia may be due to the decrease in rate of elimination resulting from hepatic or renal impairment.

The effects of tribromethanol (avertin) on the liver are usually transitory and of no significance.

In the majority of instances the pathologic changes in the renal system following the use of anesthetic agents is transitory. However, in those cases in which there is pre-existing renal damage the period of recovery may be considerably prolonged. The chief physiologic change in the kidney during anesthesia is an alteration of blood flow. Usually it is diminished and is manifested by a decrease in urine output, followed by a compensatory increase. Anoxia and increase of adrenalin in the blood stream are two conditions which result in renal vasoconstriction and decreased output of urine. As with other capillaries, those of the kidney become atonic and undergo an increase in permeability in the presence of marked anoxia. With the use of agents which have a chloroform-like action there is an increase in nitrogen content of the urine. This is thought to be a result of toxic split products originating from liver necrosis.

There is apparently a direct relationship between the amount of kidney change following anesthesia and the age of the individual. Experimentally it has been found that there is an increase in the lipoid material in the kidneys of older patients which in some manner enhances the deleterious effect of some anesthetic agents. By removing this material prior to anesthesia the senile kidney can be made to take on the characteristics of the young kidney. It was found experimentally that this removal can be accomplished by the administration of a weak alkaline solution or by a solution of glucose.

Luckhardt and Lewis found that in experimental animals there was no significant change in kidney function following use of ethylene as an anesthetic agent.[5] The same is true of nitrous oxide. However, with either of these agents there is the possibility of anoxia which may result in either temporary or permanent damage. Tribromethanol (avertin) in the presence of even a mild nephritic condition is a hazardous agent. To be eliminated, avertin must be broken down into tribromethanol glyconurate. In the presence of kidney damage the excretion of this agent is hindered or prevented. When this occurs the patient fails to recover consciousness, the temperature gradually rises, convulsive seizures often occur and death may ensue.

Spinal and regional agents apparently have no deleterious effect on the diseased kidney. They may be used with impunity so long as precautions are taken against anoxia. It must be remembered that the administration of oxygen may in itself be insufficient to prevent anoxia; attention must be paid to the oxygen-carrying capacity of the blood. Thus in the presence of ample oxygen the patient may become anoxic as a result of anemia through blood loss or as a result of blood stagnation following a severe drop in blood pressure. This often happens when the patient is in position for a kidney operation, particularly when spinal anesthesia is used.

BARBITURATES

All barbiturates are derivatives of barbituric acid which in turn is a condensation of urea and malonic acid. Various substitutions in the basic formula cause changes in the properties of the resulting drug. To date well over eleven hundred different barbiturates are possible, of which several hundred have been prepared. It has been found that those preparations having a higher molecular weight are shorter in action, are higher in potency and are broken down in the body, probably in the liver, by means of disruption of the malonyl urea ring. Those preparations having a lower molecular weight are longer in action and are excreted unchanged, for the most part in the urine. The short acting group includes such drugs as ortal, amytal, nembutal, phanadorn, pernoston, evipal and pentothal. The longer acting group includes barbital, phenobarbital, ipral, neonal, dial and others. In individuals with kidney disease the action of long acting barbiturates may be prolonged by faulty elimination, since the drug is eliminated unchanged by the kidney. In the short acting group, liver damage prolongs the effect, since this group of drugs is broken down in the liver before elimination.

Experimentally it has been shown that the normal recovery time following the use of long acting barbiturates is increased over seven times after nephrectomy. Thus it would seem that the use of long acting barbiturates in the presence of renal disease is contraindicated. However, short acting barbiturates may be used with discretion in these cases, for premedication, short anesthesia and induction for longer anesthesia, without deleterious effects. In those cases in which early recovery to full consciousness is desirable following barbiturate anesthesia the intravenous use of a 10 per cent dextrose solution is helpful. By its use the recovery period often is shortened by as much as 50 per cent. Intravenous benzedrine may also be used for this purpose.

Other factors worthy of consideration when barbiturates are to be used are the kind of operation and the length of time it will take. If the operation is long and the tissues must be greatly disturbed, more of the drug will be required. Consequently the morbidity rate will increase. Most morbidity as well as mortality following barbiturate anesthesia is the direct result of anoxia. The only sensible remedy for anoxia is oxygen. Various drugs have been advocated for combatting respiratory depression, and there are anesthetists who, although insisting that picrotoxin or some similar drug be at hand when the barbiturates are administered, give no thought to the immediate availability of oxygen. Because the respiratory depression produced by the barbiturates is central in origin, the patient in whom obstruction develops apparently does not put forth the effort to breathe that is observed after obstruction from some of the other anesthetic agents. Thus it is essential that the respiration be observed more closely and that facilities be at hand for the maintenance of an open airway and administration of adequate oxygen.

There is a general belief that, because patients who have been anesthetized with intravenous injection of a barbiturate seldom vomit on emergence from anesthesia, this is a safe method to use in the presence of a full stomach. This belief is absolutely unfounded. Regurgitation and aspiration of stomach contents, which is a possibility with any general anesthetic agent, is more dangerous under intravenous barbiturate anesthesia because of the respiratory depression caused by the drug. It is also a fact that laryngeal reflexes are not depressed under this form of anesthesia to the same extent that they are under other agents. For this reason laryngeal spasm is likely to occur in event of irritation from mucus or blood. It is also likely to occur as a reflex phenomenon following such procedures as stretching of the rectal sphincter or traction on the viscera. To overcome laryngeal spasm under barbiturate anesthesia requires that the anesthesia be carried to the lower planes of the third stage. This in many cases would be dangerous. Two other alternatives exist; namely, administering oxygen under such pressure as to force it between the spastic cords, or paralyzing the spastic cords by means of curare or some similar agent.

Intravenous barbiturate anesthesia in the presence of uncontrolled diabetes is hazardous; death may occur suddenly after only a minimal amount of the drug. The exact cause of death has not been determined in these cases. However, there has been a sufficient number of fatalities to cause anesthetists to hesitate in giving this form of anesthesia where the blood sugar content is above 150 mg. per 100 cc. of blood. In a like manner experience has taught that barbiturate anesthesia is to be used with caution in the presence of liver damage such as is found in chronic hepatitis or untreated, long-standing lues.

MANAGEMENT OF PATIENTS WITH HEART DISEASE

The management of anesthesia for patients with heart disease who must be operated upon is a complete subject in itself, but a few pertinent points may be of aid in evaluating the risk and in determining the anesthetic agent of choice. Although choice of agent is important, there are other factors which should receive as much or more consideration. Among these are the age of the patient, cardiac reserve as determined by the activity of the patient, life expectancy from a cardiac standpoint, and the nature of the cardiac defect. A patient who has a history of coronary attacks with anginal pain and dyspnea, or one having evidence of coronary sclerosis, is a very poor anesthetic risk. In the same category is the patient who presents uncompensated congestive failure. Cardiac enlargement is significant in that it often denotes a condition which is progressive and of long standing.

In choosing an anesthetic agent for the cardiac patient, attention must be given to the possibility of complications such as pneumonia, peritonitis, and others. That agent should be selected which will contribute least to the occurrence of such complications. Valvular disease, tachycardia, auricular fibrillation and auricular flutter as such do not substantially increase the anesthetic risk. The increase in risk resulting from such lesions as pulsus alternans, heart block and bundle branch block is directly proportional to the diminution in cardiac efficiency which they produce.

Because of their extreme toxic action on cardiac muscle, chloroform and ethyl chloride are contraindicated as anesthetic agents. Ether, which has approximately one twenty-fifth the toxicity of ethyl chloride or chloroform, is a far safer drug to use. With ether the cardiac output is increased, as is the mean blood pressure, while with chloroform or ethyl chloride the opposite is true due to cardiac dilatation which is directly proportional to the depth of the anesthetic. Nitrous oxide and ethylene have no deleterious effect on heart muscle, provided anoxia is prevented. The exact effect of cylopropane on the heart cannot be definitely stated. The arrhythmias seen with this agent are thought by many to be an extrinsic effect rather than a direct effect on the muscle itself. One objection to this drug in certain operations, such as thyroidectomy, is that the true pulse rate cannot be obtained since the rate of the pulse varies markedly with the depth of the anesthesia. However, from a purely cardiac standpoint cyclopropane is considered a safe agent to use in the absence of cardiac irregularity.

The cardiac patient will tolerate average doses of the local anesthetic drug. However, where a considerable amount of a local agent is to be used it is well to select one of the benzoic acid derivatives (procaine) in preference to one of the quinidine-like drugs (nupercaine). The latter in toxic doses exerts more of a chloroform-like action on the heart muscle. It is extremely important that the cardiac patient shall not suffer a drop in blood pressure or a bout of anoxia during anesthesia. As regards patients with coronary disease or atherosclerosis, this cannot be overemphasized. Likewise the cardiac patient is not tolerant of sudden severe changes in position while under anesthesia. Kraske found that in patients suffering from myocardial disease, acute dilatation of the heart was likely to occur as a result of steep Trendelenburg position. Others feel that this danger can be minimized by using a less severe position and by not permitting respiratory embarrassment.

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Discussion by MALCOLM H. HAWK, M.D.

We are indebted to Dr. Warnock for bringing again to our attention some of the factors which are responsible for anesthetic morbidity. The conditions which represent morbidity are sometimes a threat to the patient's life as well as usually causing him increased discomfort and increased hospital stay. For both of these reasons a consideration of this subject is worth while. Dr. Warnock mentioned that this subject has received little attention. With this I heartily agree, and I think it is the fault of the anesthetist. In order to make any advance from a study of morbidity one must have accurate records of the patient's preoperative condition, of the anesthetic and operation and of the postoperative course. Careful evaluation of such records will show us wherein we may improve our methods. Maintaining such a set of records is a lot of work and time-consuming, and it is done only in teaching institutions. Such records when studied have shown, in addition to the factors mentioned by the speaker, that the skill and ability of the anesthetist is probably the outstanding influence in anesthetic morbidity. Therefore if we are to decrease morbidity we must have an accurate evaluation of the patient's condition, we must strive to improve our own abilities, and we must keep records.

I would like to emphasize Dr. Warnock's remarks about the intravenous administration of the opiates and hypnotics. One should administer the drug slowly until the desired effect has occurred, and then stop. I have been surprised how little it takes for some individuals and how much for others. The same dosage administered intramuscularly or subcutaneously might be a serious overdose or not of sufficient effect. During the past war it soon became apparent that the intravenous route was the safest and most satisfactory way to administer morphine to the battle casualty in shock. Repeat subcutaneous injections were frequently given because there was no effect, and later when the patient came out of shock he developed acute morphine poisoning.

I do not wish to take issue with the remarks about chloroform, but I would like to call your attention to a series of articles which will soon appear from the department of anesthesia at the University of Wisconsin. This group administered chloroform to a large number of patients for a variety of surgical procedures with complete studies of liver and renal function. They found that when chloroform was administered by experienced individuals and with a high oxygen content, the morbidity was comparable to that with other agents.

The management of the patient with cardiac disease is, as has been pointed out, a problem. The speaker briefly but adequately and accurately covered the salient points in evaluating such a problem. I would urge you to discuss this subject at every opportunity with the surgeon and the internist, for some of them are confused as to which conditions, when present, make that patient a poor risk and which ones do not.

Metabolic Effects of Renal Insufficiency in Children

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SUMMARY

Chronic kidney disease in children is frequently associated with stunting of growth or dwarfing. The bones in many of these patients lose some of their essential minerals —calcium and phosphorus. Diets which are alkaline and contain high calcium, low phosphorus, are of value with regard to preventing the bone defect. Aluminum hydroxide by mouth may have a similar beneficial effect. Underlying both the dwarfing and the faulty bone development, may be loss of calcium or phosphorus or interference with the body's use of hormones and vitamins.

THE metabolic effects of nephritis may be said to depend largely on either excessive loss or abnormal retention of metabolites. In terms of physiological function, this means failure, or excessive filtration by the glomerulus and/or reduced or excessive tubular reabsorption and diffusion. To this should be added the not too clearly understood function by which the kidney is able to convert amino acids to ammonia.

Since our information is gathered piecemeal, it will be best to keep in mind that the functions of an organ, such as the kidney, are probably more interdependent and correlated than appears from our initial observations; that time will make the entire pattern not so obviously a series of unrelated functions, and that normal metabolism is the balance of active exchange (intake and output) of elements in the internal environment, or the metabolic pool.

I. WATER

This metabolic pool depends upon adequate amounts of water. All metabolic processes are carried out in a fluid medium. The excessive loss or retention of water may profoundly interfere with metabolism. This is particularly true of children, who have poor reserves or stability, and who are frequently seen in a condition of dehydration. More spectacular, of course, is the excessive retention of water leading to edema. The circulation is embarrassed in both instances; one the one hand by concentrated viscous blood plasma, and on the other by accumulation of fluid in the intercellular areas. The reabsorption of water by the tubules is influenced by the pituitary hormone. But the distribution of water in the body depends on osmotic pressure relations between intra- and extracellular compartments. Hence, the distribution of water in the body depends on the relative concentrations of sodium and chloride in the extracellular fluid, and on potassium, phosphate, and protein in the intracellular spaces. Hence, too, the metabolism of water is closely linked with that of the electrolytes, particularly sodium and chloride in the extracellular fluid. In the case of sodium there is evidence of another hormonal factor, namely, the adrenocortical control of tubular reabsorption. Lack of this adrenocortical hormone causes a marked diuresis or loss of sodium and failure of tubular reabsorption. The pituitary also influences, to a lesser extent, sodium excretion, but lack of it causes excessive reabsorption of the sodium, suggesting an effect antagonistic to that of the adrenocortical hormone.

Renal dysfunction may cause loss or retention of water and salt. Early in renal disease one may find increased tubular reabsorption of water and salt, whereas later in the disease, failure of reabsorption may be found. Salt may be lost in excess of water, or water in excess of salt. In contrast with the loss of protein, which is the greater cause for the retention of water in nephrosis, edema may be found in other renal deficiences, from retention of electrolytes, particularly sodium. In children we are prone to consider congestive heart failure as the result, not the cause, of such edema.

When sodium and chloride are retained and water lost, because of mild kidney disturbances, the extracellular water becomes hypertonic, and hence creates the threat of dehydration of the intracellular fluid. It should be kept in mind lest there be overzealous administration of salt solution in treating such conditions as surgical shock and diarrhea.

II. ACIDOSIS

The metabolic processes function within a rather limited range of pH. We may assume from the index of the serum that the optimum neutrality of the metabolic pool is at a pH of about 7.4. If the pH were to shift so that it were as acid as distilled water or as alkaline as tap water, we would be confronted with dangerous failure of cell function.

The body maintains this narrow range of neutrality in the metabolic pool by a series of defenses. The first line of defense is the buffer salts—the bicarbonate and diphosphate which are able to neutralize acids or bases, replacing them with

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weaker, less strongly ionized acids or salts. In the instance of the bicarbonate the weak acid, carbonic acid, leads to hyperpnea and the pulmonary excretion of the excess carbonic acid. Other acids, however, are not excreted by the lung, but by the kidney.

Hence, we may well consider that the kidney functions as a second line of defense, after the bicarbonate buffer and its adjusting respiratory excretion. While the blood pH varies within the narrow limits described, the urine pH has a much wider range. The kidney may secrete a substance as acid as a pH of 5, or as alkaline as a pH of 8. This ability of the kidney to secrete or excrete a substance so much more variable than the parent substance, the plasma, is, in itself, remarkable.

Until recently, it was assumed that in the selective reabsorption of sodium, both in the case of sodium bicarbonate and disodium acid phosphate, the tubules were responsible. However, it now appears likely that through the action of carbonic anhydrase, hydrogen ion itself becomes available and is exchanged for the sodium ion. Another important factor is the manufacture of the potential base radical, ammonia. The parent substance was long thought to be urea, but with recent isotopic nitrogen studies, it has been shown that the ammonia is manufactured directly from deaminated amino acids in the tubules. In any event, the formation of ammonia effects considerable base saving in the presence of potential acidosis—as much as 75 per cent of the acid being cleared by ammonia in extreme cases. Conversely, in nephritis involving damage to the tubules or to enzyme action, a very important defense against acidosis is lost, by the failure of ammonia production.

Most cases of renal insufficiency are marked at some time by disturbed acid-base balance in the direction of acidosis. Retention of acid, such as chloride and sulfate, is, however, of small import compared with the loss of fixed base, that is, sodium, because of the failure of the base-saving ammonia production.

When acidosis persists, further defenses are alerted. Reserves of less immediately available base are called in. Potassium, for example, which is the characteristic base electrolyte of the intracellular fluid, has a low clearance, being rapidly reabsorbed by the tubules. While some potassium may be lost with (but independently of) sodium, retention of potassium thus far is found only in extreme degrees of nephritis with extreme oliguria. Some studies suggest, however, that disturbances of cardiac conduction and muscular tone might be related to potassium depletion in nephritis.

Calcium and phosphorus are more acceptably related to the neuromuscular irritability. Cells contain both calcium and phosphorus, but phosphorus preponderates. Both these electrolytes are, of course, also distributed in the extracellular fluid and are approximated quantitatively from the blood. But it is in bone tissue that we find the greatest reservoir of calcium and phosphorus.

Since we must consider the skeleton not as a static "foreign body," but as a dynamic organ whose components are undergoing exchange and reflect the state of balance between intake and elimination, the metabolism of calcium and phosphorus thus becomes related directly to many of the pathologic changes of bone. In children growth demands place an additional strain on the metabolism of these electrolytes, which offers a possible explanation for the frequency of bone diseases in young children.

When measured by blood chemical analysis, calcium may be from 9 to 11.5 mg. per 100 cc. Of this, 4 to 5 mg. is bound to protein; 5 to 6.5 mg. is diffusible. Of this diffusible fraction, about 4.75 mg. is ionized. The glomerulus filters the ionized portion of the calcium and there is apparently excellent tubular reabsorption.

In the case of the reciprocal element, phosphorus, we find filtration by the glomerulus is subject to a restricted tubular reabsorption. This tubular reabsorption is influenced by the parathyroid gland—excess of parathyroid extract reducing the amount of phosphorus reabsorbed. Hence, we have diuresis of phosphorus as a result of excess parathyroid hormone. Following the diuresis of phosphorus, there is a reduction of blood phosphorus, and calcium rises in a reciprocal relation. When the calcium elevation of the blood is marked, diuresis of calcium occurs. The net effect of parathyroid is to reverse the channel of excretion, which is ordinarily 70 per cent by bowel and 30 per cent by kidney, and to withdraw calcium from the bone or skeletal reservoir.

In renal insufficiency both calcium and phosphorus are reduced in the urine. Examination of the blood, however, shows that phosphorus is preferentially retained, while calcium is excreted in the feces. This is not fully understood. Possibly an inactivation of vitamin D occurs and there is failure of absorption of the calcium from the bowel.

Clinically, however, this metabolic defect would appear related to two conditions seen in childhood:

1. Tetany of the newborn and, in some instances, in older children.

2. Demineralization or renal rickets, with possible parathyroid dysplasia.

Evidence has accumulated that the renal function is far from perfect in the neonatal period. Convulsions and neuromuscular irritability have been found in some instances, with elevated blood phosphorus and lowered blood calcium. The therapeutic response to acid salts, ammonium sulfate, chloride, and to calcium, as well as to the treatment of dehydration, strongly suggests that this is tetany with low ionized calcium.

On a similar basis, tetany may occur in nephritis of older patients where the retained phosphorus depresses the calcium. However, it must be emphasized that usually a coexistent acidosis tends to favor an increased ionization of the calcium, counteracting the effect of the lowering of the total calcium.

It is obvious, however, that with a minor shift toward alkalinity, such as might occur with vomiting and loss of gastric hydrochloric acid, there might be a sudden change in the ionization of calcium, which could conceivably precipitate tetany. Parenthetically, this should make us pause when we attempt to treat the acidosis of nephritis of these types with alkalies, unless we know and follow the state of the calcium and phosphorus.

Long-standing renal insufficiency in the growing period of childhood is often marked by retardation of growth—so-called renal dwarfism. Whether this is a starvation phenomenon because of upsets in the metabolic pool or internal environment, or because of inactivation or loss of vitamins or hormones, is not known. In all likelihood, the skeletal demineralization would be more marked if growth were not retarded.

Presumably, however, the chronic acidosis, and particularly that with phosphate retention, draws from the skeleton in a fashion similar to that which we induce when we "de-lead" patients to remove the lead precipitated by the initial alkalinization therapy.

The terminology for this demineralization which is seen in the acidosis of chronic nephritis, is perhaps unnecessarily confused. Ardent advocates are found for the terms, renal rickets, renal dwarfism, renal osteodystrophy, renal osteomalacia. It has been pointed out that the similarity of the demineralization to that found in certain cases of hyperparathyroidism, is marked. Hence, we also have the terms, renal hyperparathyroidism, and renal osteitis fibrosa.

The prognosis for patients with the advanced states of chronic nephritis is poor. So far as the demineralization of skeleton is concerned, we believe we have checked this process by the use of low-phosphorus alkaline-ash diet combined with aluminum hydroxide. But it should be remembered that these patients have a very limited function of the kidney, and that such other metabolic defects which relate to anemia are not affected by the program of treatment. In addition, the diet and aluminum hydroxide may have undesirable effects.

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On Schmerz—in der Mitte und Elsewhere

As fine raiment may conceal the scrawniness of its wearer, error associating itself in the fellowship of truth may escape detection by the jaded editorial eye. Sharper eyes, however, may be counted upon to strip the trappings from the scoundrel error and expose the wry offender.

Readers of this journal in humiliating numbers have called attention to the following observations which appeared in an article in the December issue:

"Acute abdominal pain is frequently caused by painful ovulation which is not recognized by the surgeon or by the attending physician. . . . This condition is also known as intermenstrual pain or Mittelschmerz's disease. . . .

"This condition has been known for over a century, as Pouchet in 1847 discussed it in a book on ovulation and conception in mammals. Sir William Priestly in 1782, Howard Kelly of the United States, and Mittelschmerz in Germany discussed the condition frequently."

To the raillery and scoldings of our readers, we, in our discomfiture, can only reply that we also have a Schmerz, but not quite in der Mitte.

If it is accepted that to err is human, to forgive divine, California Medicine takes some solace in being thus bracketed, the more so if its readers now generously show the spark of divinity.

Problems in Radiological Interpretation

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SUMMARY

Recent comparative x-ray studies demonstrate: (1) Photofluorography is a relatively efficient tool for tuberculosis case finding. (2) All photofluorograms should be interpreted independently by two competent interpreters. (3) The activity of a lesion cannot be determined from a single roentgenogram.

There is a variation in film interpretation between different observers, similar to that noted in many other fields which have been subjected to valid test. This variation is now the source of extensive investigations, out of which should come considerable progress in all branches of medicine.

The recent intensive activities in mass radiography present to radiologists and chest specialists problems in diagnosis which are different in one essential element from those encountered in clinical work. In the latter, medical diagnosis is derived by a process of integration of a number of related observations and results of different kinds of tests obtained by repeated studies of the case. If a radiological examination is made in the course of such studies, the x-ray findings form only one link in a chain of pertinent evidence provided by physical examination and by other tests. In mass radiography, however, the physician is called upon to provide at least a tentative diagnosis on the basis of the appearance of the x-ray alone.

Since mass radiography is conducted among apparently healthy individuals, the persons examined are, on the whole, free from symptoms. In the majority of cases, the shadow on the x-ray film is the only basis for decision whether the patient is to be recalled for further study and how frequent and intensive the follow-up should be. In other words, mass radiography acquired certain functions of the primary diagnostician, which are different from those of a diagnostic aid to which clinical radiology is limited. It is doubtful whether any other branch of medicine is called upon to perform the functions of diagnosis with such limited observations.

In performing these diagnostic functions, the radiologist and chest specialist are further handicapped by the lack of experience on the probable prognosis of the types of lesions observed in mass radiography. These are more often of minimal extent and more fibrotic in character than those encountered in cases referred because of symptoms. Since mass radiography is a relatively new activity, not enough experience has been accumulated on which a comprehensive policy of treatment can be based.

In view of these limitations it is, perhaps, not surprising to find that diagnosis in mass radiography is not so definite as may be desired and that considerable variation can be demonstrated to exist in the interpretations of the same set of films by different readers and even in independent interpretations by the same reader. The existence of these variations poses a number of practical problems which can only be answered by intensive study of the many phases of diagnosis by means of x-ray. The main purpose of such investigations is to discover methods of improving and supplementing current practices of diagnosis in mass radiography in order to assist it in performing more efficiently the extraordinary task which has been placed upon it.

The problems of diagnosis by means of x-ray may conveniently be separated into two components. The first relates to the ability of the interpreter to detect "positive" cases—that is, his ability to separate photofluorograms into two groups, one which contains as nearly as possible all films with x-ray evidence of tuberculosis, and the other which contains all films which show no such evidence. The second problem relates to the ability of the interpreter to prognosticate from the appearance of the x-ray film shadow the probable severity and the course of the disease.

Theoretically, it may be argued that once the first task has been performed and the persons with x-ray evidence of tuberculosis have been selected, radiology has completed its task and the second problem becomes one for the clinician. In practice, however, it is found that the appearance of the x-ray film, and especially such changes in the appearance as may occur with the passage of time, forms the only available evidence of disease on a relatively large proportion of the cases and must therefore be relied upon almost exclusively for decisions as to the course of treatment.

Several attempts to study the two phases of this problem have been made in the last few years by a number of leading radiologists and chest specialists in the country. Recently, a group of radiologists in California have undertaken similar studies. Although no positive results have been attained to date, the problems, at least, have been more clearly defined. It may therefore be worthwhile to present a brief review of the methods and results of these investigations and such tentative conclusions that may be derived from them which could be of assistance in mass photofluorography.

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THE EFFECTIVENESS OF PHOTOFLUOROGRAPHY FOR TUBERCULOSIS CASE FINDING

The problems of variation in x-ray interpretation came to the fore in the course of an investigation on the relative effectiveness, for tuberculosis case finding, of various photofluorographic and roentgenographic methods. In this study, some 1,200 persons comprising the entire population of a Veterans' Administration institution were x-rayed consecutively on four different x-ray machines, providing for each person a 35 mm. photofluorogram of the chest, a 4 by 10 inch stereophotofluorogram, a roentgenogram on 14 by 17 inch paper negative and a conventional 14 by 17 inch celluloid film.

The four sets of films were interpreted independently by five experienced radiologists and chest specialists, members of a special board of roentgenology appointed by the Veterans' Administration. In addition, a second independent interpretation of the set of 14 by 17 inch celluloid films was obtained from each of the five members of the Board.

The original approach in that study was to compare the performance of the miniature and paper methods with that of the 14 by 17 inch celluloid films. In the course of the analysis, however, it was found that it was not possible to use the interpretations of the 14 by 17 inch celluloid films as a standard because of the great variation which exists, even on this method, for the different readers and between the independent interpretations of the same reader. This finding accentuates two problems. First, the lack of a standard makes it difficult to compare the effectiveness of the different photofluorographic methods. Second, it becomes important to investigate the implications to mass photofluorography of the inter-individual and intra-individual variations in film interpretation.

The first problem may be formulated as follows: Since the interpretations of the 14 by 17 inch celluloid films are not as unique and definite as previously supposed, it is not possible to determine who in the examined population is "positive" and who is "negative."* Such a determination is, however, essential before the different photofluorographic methods can be compared for their effectiveness in tuberculosis case finding. For, if it is not known who, in the examined population, should be selected, it is not possible to test the effectiveness of a given method in selecting "positive" cases. This problem has been solved by a method of comparison which was not dependent on the 14 by 17 inch celluloid films alone. The details of the method may be found in previous reports of this investigation.[1, 2] Briefly, the method utilized the evidence provided by all four methods, through the interpretations of all five readers for defining the persons examined as "positive" or "negative." By this method it was possible to compare objectively all the methods without a preconception of any one of them as a standard. In other words, each person in the study had 20 chances to be called "positive" since there were five readings on him for each of four films. A person, therefore, was considered to have x-ray evidence of tuberculosis if at least 11 of the 20 readings were positive for tuberculosis. The different methods were then compared according to the number of positive readings which each of them contributed on these "positive" cases. It might be expected that the more efficient method would contribute more positive readings on these cases than one which is less efficient. It was found that the number of positive readings was nearly the same for each of the techniques.

On the basis of this finding it was concluded that, strictly from the standpoint of their effectiveness in finding cases of tuberculosis, none of the methods, not even the 14 by 17 inch celluloid, is superior to any of the other methods.

It is probable that the second problem, that of variations in film interpretation, was a contributing factor to this finding. In other words, the result may also be stated as follows: The subjective error in film interpretation is so large, that compared with it, such differences in superiority as may exist between the different methods is small enough to be negligible.

The subjective error as measured by variation in film interpretation was found in that study to be of the order of magnitude of approximately 25 per cent. In other words, nearly a quarter of the films which were called positive by one reader were called negative by another. The degree of inconsistency of each reader with himself was found to be of approximately the same order of magnitude.

SUBJECTIVE ERRORS IN FILM INTERPRETATION

The unexpectedly large subjective error in film interpretation observed in the Veterans' Administration study was disturbing to a number of radiologists. Doctor W. Edward Chamberlain, who participated in the Veterans' Administration study, thought that the subject was deserving of further intensive study and at his initiative a board of radiology was appointed by the U. S. Public Health Service to conduct such an investigation. The members of the board are Dr. Chamberlain of Philadelphia, Dr. Leo Rigler of Minneapolis and Dr. Robert Newell of San Francisco. The board, at the time this presentation was prepared, had been at this problem for nearly two years. It is not my intention here to "steal their thunder" and present to you a premature account of their findings. I know that a comprehensive report of the results of that study will be published in full. I may, however, indicate in very general terms the trend of their findings.

In the first place, in their initial trials, the magnitude of the variations in calling a film "positive" or "negative" was found to confirm the results of the

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*The terms "positive" and "negative" as used in this paper do not refer to proven cases of tuberculosis, but to persons whose x-rays show or do not show shadows suggestive of tuberculosis.

Veterans' Administration study. In fact, on a set of 100 films, on which are available the results of 20 independent interpretations of ten radiologists and chest specialists throughout the country, similar findings were observed. As a curiosity it may be worth mentioning that at the last count of the readings on these 100 films which were selected to contain approximately 33 "positive" films, only fourteen were called "negative" by all the readers, and for fully 93 films there is at least one positive reading by one or more of the ten readers.

The board concentrated its efforts on attempts to devise methods of film interpretation and on the development of nomenclature which would lead to greater consistency. All the accepted terms used in radiology of the chest were carefully tested and found to be unreliable to a greater or lesser degree. These run the entire gamut from the National Tuberculosis Association classification of minimal, moderately advanced and far advanced, through attempts at simple description of the texture of a lesion. It was found that it is apparently not possible to determine the activity of a lesion from the appearance of the x-ray shadow, since too many lesions which are called active by one reader will be called inactive by another. Moreover, the same reader is likely to call a lesion inactive when he has previously called it active. Similar limitations apply when a lesion is described as "soft," "hard," "exudative," "productive" or "fibrotic." The same lesion may appear as "band-like" at one reading and as "fan-like," "linear" or "round" at another. It may be called "poorly defined" once and "well defined" another time. Similarly, no reasonable agreement can be obtained either among different readers or for a single reader with himself in describing a shadow as "homogeneous," "honeycombed" or "spotted."

In general, it may be stated, that while it may be possible by special effort and training to succeed in reducing somewhat the variation in calling a film "positive" or "negative," no appreciable progress has yet been made in getting a group of radiologists to use common language in describing what is seen on the x-ray.

It may not be out of place to say a few words here on the problem of serial films. The general impression is that all these problems arise from the fact that so much is asked from the interpretation of a single film, but, that if a set of films taken at different periods were available, no such problems would arise. This is not entirely true. In connection with these activities on film interpretation, the U. S. Public Health Service established long-range follow-up studies on persons discovered through mass radiography. These studies are being run concurrently with the radiological investigations because it is realized that the acid test of such schemes that will be developed in film interpretation lies in their correlation with prognosis. It is much too soon for any pertinent conclusions to be drawn from these studies but on the question of serial films considerable information is already available.

As soon as a set of two films on the same individuals became available and was sent to different readers for interpretation as to stability, progression, or regression, it became apparent that there is as much variation in the interpretation of a set of serial films as there is in that of a single film. Since then considerable experience has been accumulated on interpretations of sets of five or six films taken on the same individuals at three monthly intervals. It is revealing to observe several competent radiologists and chest specialists review the same set and arrive at different conclusions as to the stability of the lesion over a period of 15 to 18 months.

The difficulty in this case appears to result from technical differences in positioning, stage of respiration, film development and the like. It becomes a question of how much of the difference in the x-ray shadows the radiologist is ascribing to these technical factors and how much he thinks is due to changes in the lesion. The net result is that with the exception of very obvious progressions or regressions, it is difficult to determine from a series of films whether the lesion is active or inactive.

DISCUSSION

In studying the implications to photofluorography of the inter-individual and intra-individual variations in x-ray interpretation, it may be well to differentiate between ultimate and immediate objectives. Final solution to the basic problems of variation in x-ray diagnosis will evolve only as a result of fundamental research in the underlying causes for the phenomenon of variation. Many different branches of science: physics, psychology, medical optics, semantics, and many of the medical sciences, will, no doubt, supply important contributions to the final solution. In addition, more knowledge on the ultimate course of the disease and its correlation with the x-ray appearance will need to be accumulated and integrated with the purely radiological investigations. These studies, obviously, are long-range and require intensive effort.

The immediate objectives are to utilize such knowledge as is available in attempts to improve, as far as possible, present practices in radiology. It is not necessary to wait for the final solution for the development of methods of interpretation and tentative methods of classification which will reduce the variation in x-ray diagnosis. In fact, considerable improvement in the practice of photofluorography can be attained by the application of certain conclusions which may be drawn from the results of these studies to date.

In the first place, it is important not to lose sight of the main result of the Veterans' Administration study, which is, that for case-finding purposes it is just as safe to operate with the miniature methods as it is with the expensive and cumbersome 14 by 17 inch celluloid method. In view of the rather extensive activities in the field of photofluorography, this may sound like a superfluous assertion. Nevertheless, it is reassuring to know that the methods employed in mass case-finding programs are as efficient as the best available.

The second practical conclusion which may be drawn from a knowledge of the magnitude of variations in film interpretation is that a simple method is available to safeguard against much of the harm which may be caused by these variations. This can be attained by the simple procedure of having at least two independent interpretations of each set of films. If the probability of overlooking a positive film is approximately 1 in 4, then the probability of missing a positive film in two independent readings is 1 in 16, and that in three independent readings is only 1 in 64. It therefore becomes possible to obtain almost any degree of precision by the simple expediency of multiple reading. How many such readings are desirable is in the long run a matter of individual taste. To some persons the oversight of even one positive case is a matter of grave concern. Most of us, however, must take into consideration the practical problems involved in multiple readings. When approached from this practical point of view it can be demonstrated that double reading is actually an economical procedure. This may perhaps be illustrated by the following example: Suppose 10,000 persons were examined. If the prevalence of tuberculosis in this group is one per cent, there are 100 persons in the group who should have been selected. A single reading of the 10,000 films will uncover approximately 75 of them. By means of a second independent interpretation of these films, 18 or 19 of the remaining 25 will be discovered. In order to find 18 or 19 cases by other means, another group of some 2,000 individuals must be examined. It may be easily shown that the expense involved in the latter process is greater than that of a second reading of the original 10,000 films.

It is realized that it is relatively easier in these times to find technicians to operate mass survey projects than it is to secure the services of competent physicians to interpret the films. Nevertheless, it is false economy to conclude that the agency cannot afford the "luxury" of double reading. It is by no means a luxury. It is good dollars and cents economy.

The third conclusion which may be drawn concerns the type and intensity of follow-up indicated for cases discovered in mass photofluorography projects. Since it is impossible to determine from the appearance of the x-ray shadow the activity and probable prognosis of the lesion, it becomes important to keep under frequent and continuous observation the majority of cases discovered in these projects. It happens too often that a patient that one specialist would dismiss as requiring no further study would have been kept under close observation, and even hospitalized, if the opinion of another, equally competent, specialist would prevail. In fact it is likely that the first man would have called the same case active on another reading of the same x-ray. It follows, therefore, that at the present stage of knowledge, a conservative policy of keeping a large proportion of these cases under observation is desirable.

In addition greater efforts must be exerted to supplement the x-ray findings with other tests, particularly with bacteriological examinations. Since many of the patients do not raise sputum, special efforts must be exerted in securing samples of gastric lavage in as large a proportion of the cases as is possible. This may not be too easy, but judging from the experience in Denmark, the efforts will be greatly rewarded. For example, last year 136,000 persons 15-35 years of age in Copenhagen were x-rayed. As a result of these examinations, 344 persons were found with positive sputum or gastric washings. The striking fact is that in fully 72 per cent of these 344 persons the tubercle bacilli were isolated from samples of gastric lavage. In other words, in this country, where stomach washings are not very commonly used, only about one-fourth to one-third of the 344 patients would have been definitely diagnosed as having tuberculosis. In order to obtain full benefit of the case-finding programs, at least as much effort should be devoted to the follow-up of the cases as was exerted in discovering them.

In conclusion, it may be worth emphasizing that the demonstration of the variation in film interpretation need not be considered as a negative result. A knowledge of the magnitude of such variations may be used in a very positive way in determining many practical problems of policy in mass radiography. However, intensive and concentrated study is indicated for a real attempt at determining the fundamental problems of the underlying causes for these variations as well as of many other phases of the general problem of diagnosis by means of x-ray. A number of competent persons and groups throughout the country are engaged in such research and it may be hoped that through their efforts great progress will ultimately be achieved.

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Discussion by L. H. Garland, M.D.

The problem of mass radiography has as many facets as a well-cut diamond. One of these, the problem of reliable roentgen interpretation, has been ably outlined by Dr. Yerushalmy. In order that some of Dr. Yerushalmy's figures may be clearly understood, I think it is important to note that he uses the strict statistical approach. For example, if one of his "testing" radiologists or chest physicians is submitted 100 chest films for study, and these contain two "positives," the reader will have a score of 50 per cent inaccuracy if he misses *one* of those "positives," even though he read all the 98 "negatives" correctly. This point is noted in discussion and not defense, since the roentgen method requires not defense but clarification and intelligent usage. Errors resulting from the "personal equation" exist in all fields of knowledge; it is only in those in which the evidence is easily measurable that its magnitude can be readily demonstrated. Berkson and associates have shown the astonishing errors in estimation of simple blood-cell counts; Derryberry has exposed the incredible discrepancies in interpretation of degrees of malnutrition. The roentgenogram is only as good as the person interpreting it, and therefore subject to the not inconsiderable limitations of human perception.

There are some specific points in Dr. Yerushalmy's paper upon which I would like to comment. He stresses wisely that mass radiography is a problem in diagnosis; the physician is called upon to provide at least a tentative diagnosis on the appearance of the roentgenogram. This is noted in order to correct the specious arguments that mass surveys are not a medical or diagnostic procedure.

There is a tendency on the part of many persons, even scientists like Dr. Yerushalmy, to use the expression "x-ray evidence of *tuberculosis*." What he really means is "x-ray evidence of *disease*." The bacterial origin of the shadow cannot be determined from a single or even from serial roentgenograms. This point he emphasized himself when he referred to the "great need for accurate and frequent sputum studies." Indeed, many years ago, when mass x-ray surveys were first being projected, I had the temerity to suggest that mass sputum surveys would be a more worthwhile public health measure, since it is the contagious case rather than the person with a silent shadow who is the true public health menace.

The fact that the activity of a lesion could not be determined from the appearance of the x-ray shadow alone has been known for over 40 years. We recollect being told this in 1925. Nevertheless, in everyday clinical practice we do believe that the activity of many lesions can be more accurately estimated by serial roentgen studies than by any other objective method.

Double reading of films, that is to say, separate, independent readings by two radiologists, greatly diminishes the possibility of overlooking a positive roentgenogram. This use of double reading in minifilm surveys is wisely stressed. The readers ought to use a consistent reading technique, and their remuneration for the service should be such that there would need be no tendency to give inadequate study to apparently negative films.

* * *

Opportunities and Responsibilities of the General Practitioner

Stanley R. Truman, M.D., *Oakland*

SUMMARY

We believe in the ability of general practice to serve the greatest number of people with the best medical care, most efficiently and most economically. We believe that the physician in general practice receives the utmost in personal satisfaction for a job well done. We believe in the necessity for specialists and hold in high regard and deep admiration their fund of knowledge and fine technical skills. Who would call one branch of medicine more necessary than another? All are necessary, all must be nurtured, each commanding and deserving the respect of the others.

"GENERAL practice" is a term for a means of distributing medical care; "general practitioner" refers to the physician who is the instrument of dispensing that care. The American Academy of General Practice defines a general practitioner as a "physician who does not limit himself a single field of medicine." In these terms a general practioner is a physician who cares for the various ailments and diseases for which he has been adequately prepared by training and experience, irrespective of their occurrence in a specific organ, or system, or age group, or whether the treatment falls into a particular therapeutic category.

The idea that a general practitioner is a physician who does everything is an obvious absurdity. Never has there been a time when any man's knowledge could cover the entire field of medicine.

The field encompassed by the term "general practice" may and should include very different sets of activities from physician to physician and from locality to locality. In the isolated community the lone physician must care for all emergencies, both medical and surgical, and must be ready to deal with a wide range of other problems. He will frequently have both his abilities and facilities taxed to the limit. On the other hand, in the city the general practitioner will have more opportunity to permit his particular skills and interests to measure his field. He will be prepared to care for the common ailments, and in addition will often find that his particular bent has caused his practice to be heavier in some particular realm such as industrial medicine, obstetrics, internal medicine, or surgery. To borrow an analogy from the college curriculum, the general practitioner in the city will have a "major subject" plus several "minor subjects," and will often eliminate others from his curriculum.

We are all agreed on the absolute necessity of the specialist in the field of medicine today. Those of us engaged in general practice work and live with specialists in all branches of medicine in the most cooperative and friendly professional and personal relationships. We are also in agreement, on the basis of experience as well as the conclusion from several surveys, that about 80 to 85 per cent of ailments can be treated more economically in both time and money—and as effective medically—by well-trained general practitioners with well-equipped offices and adequate, readily available hospital facilities than by any other system.

Those of us in general practice frequently are approached by patients who are tired of the necessity of "five doctors to take care of our family." I recently reviewed the records of 100 patients to find how many separate physicians they would have had to consult if they had gone to specialists on their first visit for diagnosis and treatment of all their ailments. I found the average to be 3.7 doctors per patient. As I refer patients to specialists in about one case in four, that leaves an average of at least three doctors. It would be valueless to attempt to analyze this small number any more thoroughly, but it is sufficient to point out that from the point of view of the patient, treatment by specialization causes a marked increase in the time and money involved. The time it takes to go to three physicians, plus the time waiting to see three physicians, plus the time to see three physicians, plus the cost of supporting three physicians instead of one, will be just about three times as long and three times as expensive as seeing one physician. And this increase in time and money involved will show little difference whether the three physicians have offices under one roof or are several blocks apart.

As our national economy approaches a more stringent phase this economic desirability of the general practitioner will become steadily more apparent. It would appear that the man in, or contemplating entering, general practice is in a most enviable position. In spite of this rather obvious condition the medical trend has been moving steadily in the opposite direction; fewer and fewer general practitioners, and more and more specialists, are being trained. We have now reached the state where one feels a

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Chairman's address. Presented before the Section on General Practice at the 77th Annual Meeting of the California Medical Association, San Francisco, April 11-14, 1948.

touch of sympathy for the young man about to try to set himself up in the practice of a specialty. In many communities the ratio of specialists to general practitioners has become so great as to present a problem.

Certainly the general practitioner is not solely responsible for the quality, abundance, cost, and distribution of medical care, but if general practice is economically and medically the most desirable means of dispensing the bulk of medical care—and it is—then the general practitioner must assume a proportionate share of the responsibility for the maintenance, perpetuation and further development of general practice. The problem is how to deliver the highest quality of general practice in the amount needed.

For a long time the medical schools have been encouraging specialization and discouraging general practice. Usually this has been entirely unintentional. It is rather obvious that, for the purposes of efficient organization, the medical school would be departmentalized. We agree with the necessity for this. Furthermore we want teachers who are authorities in the fields in which they lecture and instruct, and it is logical that a man who has become an authority in a field would in many instances limit his interest, work and teaching to that field. With this we have no quarrel. Then the youth, surrounded by this departmentalization, inspired by his teachers, wishing to attain for himself a degree of their prestige and being unacquainted with any other system, is readily influenced to follow suit. We challenge the desirability of this. In order to balance the overemphasis on the desirability of specialization several medical schools have introduced seminars and lectures aimed at orienting the student in the selection of his field of practice. It is hoped that more schools will rapidly introduce this plan, and that the program will be expanded so that all schools have not only the facilities for introducing students to the various available fields of medicine, but also the means (such as aptitude and interest tests) to assist the student in selecting the field in which he would be most valuable and capable.

The second major cause for the drift away from general practice has been the tendency to curtail the hospital privileges of the general practitioner in some of the urban areas. This has ostensibly been done in an attempt to raise hospital standards, and to this purpose those of us engaged in general practice give our wholehearted support. Fortunately very few physicians ever undertake the care and treatment of illness beyond their ability, but the few who do will have to have curtailment imposed upon them. However, when access to hospital facilities is regulated not on the basis of ability, training, or experience, but on the basis of what medical society one belongs to, or whether or not one labels himself a specialist, then ulterior motives are suspected. To assume that only general practitioners attempt treatment beyond their abilities is false. Even two years after Dragstedt's report of vagotomy for ulcer, does the fact that a surgeon is a board member make him capable of doing a thorough vagotomy? Or does certification keep a man within the field of his training when the financial pinch comes? We recognize that fulfillment of board requirements is an indication of a physician's having had a specified amount of training; but ten years after, if he fails to keep up, he will be just as great a menace to hospital standards as will a general practitioner who has failed to keep up for ten years.

As to raising staff standards I believe the experience of one of our hospitals would be typical of what might be expected in hospitals throughout the country if no general curtailments were undertaken but limitations were applied entirely on individual merit. In this experience it was found that, on the basis of numbers alone, more general practitioners than specialists required limitations. On a percentage basis, however, it was found that a higher percentage of certified board members required curtailment. Since the great majority of general practitioners whole-heartedly support every attempt to raise the standards of hospital practice, if it becomes necessary to limit the use of the hospital's facilities because a few physicians overstep their abilities, the regulations applied should be based on training, experience, skill, and moral character. We know that these principles will prevail in the long run, and when and where they are applied the well-trained general practitioner of high moral character will have no difficulty in obtaining his share of hospital facilities.

I would like to quote part of a resolution adopted by the House of Delegates of the American Medical Association. (San Francisco 1946.) "The criterion of whether a physician may be a member of a hospital staff shall not be dependent on certification by the various specialty boards or membership in special societies." The leaders of American medicine in and through the A.M.A., as well as other organizations, are vigorously attacking this problem to the great satisfaction of the general practitioner.

The third major factor causing the trend away from general practice is the matter of prestige. The economic rewards from the practice of medicine are not alone sufficient to cause young men to persist in the long period of training, the postponement of normal family relations, and the maintenance of the vigorous professional and intellectual career. This intangible thing causing a man to undertake the medical career relates to his pride and has been termed prestige or esteem. The general practitioner is not lacking in this, and probably among his patients has more real solid appreciation and admiration than physicians in any other group in the medical field. However, before a man enters medicine he is more influenced by the glamour side of prestige, the side that is likely to be presented by the novelist, the press and radio. For the past couple of decades a somewhat distorted view of medical practice has been presented; too often the general practitioner has been "Old Doc," loved and capable but not glamorous, whereas the specialist has been surrounded with glamour, fancy equipment, luxurious suites, and great life-saving discoveries. The prospective doctor often is heavily influenced by such views. Fortunately these popular trends have their day and pass on. Certainly in most communities a doctor is judged by the laity and profession alike on his works, and on this basis the capable conscientious general practitioner is admired and honored. In the final analysis prestige comes as the reward for work well done. General practice does not, need not, and must not signify an inferior quality of medical care. To those of us who have elected to become and remain general practitioners, general practice means a different field of medicine, not a different quality of medicine.

Several other factors have been mentioned from time to time as exerting inducements to specialize—such things as greater income, shorter hours, and the popularity of group practice. I should like to speak a word about each of these. Analysis of the available statistics regarding medical incomes indicates that the general practitioner is in a somewhat middle position. These statistics do not show what becomes apparent on talking to men from different sections of the country: First, that year in and year out the income from general practice and specialties in the same community will be the same; second, that the general practitioner's income is more stable and secure than the specialist's, come inflation, depression, discoveries or new modes of practice. The matter of shorter hours for the specialist is again a matter of habits of practice and personal arrangements rather than a factor inherent in specialties or general practice. Certainly in urban areas, with telephone exchanges and capable colleagues with whom one can exchange time off, all physicians may decide when and how long they will work. Group practice is in vogue. The idea that these groups must be groups of specialists is an error. Except for rare examples the most permanent and satisfactory groups have been those composed of men doing essentially the same kind of work—similar specialties, industrial practice, or general practice. It would seem that the ideal group would be a group of general practitioners, giving each the maximum amount of freedom yet allowing patients the opportunity of having a member of the group as "their" doctor, and the fullest choice of specialist as the requirement arose.

Opportunity is balanced by responsibility. Those of us in or entering general practice have an opportunity and a challenge. We are joining with those leaders of American medicine who realize the great value of general practice and are doing much to perpetuate its values. We shall work as individuals and in groups. Until recently the general practitioner has not had an organization to which he could belong as a general practitioner, in and through which he could express himself, and which would encourage and assist him. Now the American Academy of General Practice is filling that need. Leading general practitioners throughout the country have joined with tremendous enthusiasm, attesting both their faith in general practice and their belief in the highest standards for general practitioners present and future.

1904 Franklin Street.

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Why Some Adults Do Not Drink Milk

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SUMMARY

About three-fourths of all adult patients not drinking milk either do not like it (48 per cent), think it disagrees with them (13 per cent), or have no reason for not drinking it (16 per cent). However, most of the patients in all groups began to drink milk when given suitable information on its importance in diet.

THE dietary histories of 1,057 consecutive eye, ear, nose and throat patients were studied for the purpose of listing the reasons given for not drinking milk regularly. It seemed important to study these histories and make this report because of the value of milk in the diet, and the possible advantage to the physician in knowing beforehand why so many adult patients do not drink it. Furthermore, it was felt the findings might suggest points for emphasis in nutrition education.

In 1935 Egbert[1] investigated the household use of milk in Philadelphia, and published reasons given by adults for and against drinking milk. He wrote: "Eighteen per cent of the reasons given by adults for drinking milk had to do with its health value, and 5 per cent because of doctor's orders, but 75 per cent of the reasons related to liking it. On the other hand, of the reasons given by adults for not drinking milk, 49 per cent were because of a dislike for it, 33 per cent because it cost too much, and 9 per cent because it was thought to be fattening." More recently Rice[3] has written for the lay public a discussion of the objections to milk. He dealt with psychological objections, the distaste for milk, and the symptoms of bloating, constipation and biliousness complained of by some people. He gave no statistics on the prevalence of these objections.

My records studied were those of adult office patients seen during the past two years. It was found that 599 of the 1,057 patients were drinking seven or more glasses of milk per week, whereas 120 took four to six glasses per week and 330 none to three glasses per week. Four hundreds patients in these last two groups gave their reasons for not drinking milk, and these are listed in Table 1.

MISCELLANEOUS OBSERVATIONS AND COMMENT

Among those 194 patients who were not drinking milk because of a dislike for it were 102 (52 per cent) who had only mild objections to it, saying "I don't care for it." Many of these promptly became milk drinkers when its importance as a food was explained. Others commenced using more milk in cooking. Among the 64 patients who were classed as non-milk drinkers because of indifference were 27 who frankly stated there was "no reason" for their neglect of milk.

TABLE 1.—*Reasons Given by 400 Patients for not Drinking Milk*

Reasons Given	No. of Patients	Per Cent
A dislike for milk	194	48
Indifference	64	16
"Disagrees"	53	13.2
Drink tea or coffee	15	3.7
Other hot beverages	4	1
Causes mucus	14	3.5
Fattening	13	3.2
Constipating	9	2.2
Doctor's orders	8	2
Allergic	9	2
Can't get it	6	1.5
Miscellaneous	11	2.7

The most commonly expected objections to milk drinking—that it is fattening, constipating or causes mucus—occur relatively infrequently. Although in a previously reported series it was disclosed that 25 per cent of the patients felt that milk produced postnasal mucus, and the author's observations were that it does not,[2] it is consoling to learn that only 3.5 per cent avoid milk because of that notion.

When a patient says that milk "disagrees" with him he may state further that it bloats, makes gas, or nauseates, or causes indigestion, colitis, liver trouble or gallstones. Actually he may be allergic to milk. However, after a trial it is often found that milk is well tolerated.

575 Fifth Street.

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A Comparison of Certain Actions of Demerol and Methadone*

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SUMMARY

Demerol and methadone have advantages over morphine. Demerol requires a higher dosage than methadone, but produces less respiratory depression. Therefore, it can be used more freely in cases where respiratory depression is contraindicated. Demerol does not depress the cough reflex, and methadone is preferred for this purpose. Both drugs have a sufficient tendency to produce addiction that the usual narcotic restrictions should be observed.

IN THE ceaseless effort to improve drugs to control pain, no substantial advances were made for about 40 years following the introduction of Pyramidon in 1896 by Knorr and Stolz,[46] and aspirin in 1899 by Wohlgemuth[74] and Dreser.[15] Finally in 1939, Eisleb and Schaumann[18, 60] broke open new territory by discovering that phenylpiperidine esters had sufficiently high analgesic power to be practical therapeutic agents. The most generally used of these is the compound Demerol[†] (meperidine or isonipecaine), which chemically may be described as ethyl 1-methyl-4-phenylpiperidine-4-carboxylate. It is used as the hydrochloride salt in the form of solutions, tablets and elixirs. The structural formula of Demerol is depicted in Figure 1. Introduction of this drug was immediately followed by its widespread use, since the new compound controls pain and smooth muscle spasm in a highly efficacious manner without having some of the disadvantages associated with morphine.

The demonstration that synthetic chemistry could produce a compound equal in therapeutic value to the opiates stirred investigators to renewed efforts. These have resulted in the synthesis of many compounds of great scientific interest.[45, 76] One, which only recently has been made available clinically as the racemic hydrochloride, is known by the common name methadone.[78] Its formula is shown in Figure 1, together with those of other related potent compounds which are still in the laboratory and early clinical stages of development.

Because Demerol and methadone have some features in common, but also certain important differences which affect their therapeutic applications, it was thought worthwhile to compare here a few aspects of their pharmacology and therapeutics to bring about a more accurate appraisal of their relative values and to aid in their proper clinical utilization.

ANALGESIC POWER

The analgesic power of these compounds may be studied by many procedures against a wide variety of painful stimuli. In a method being used in our laboratory,[53] heat from a bright light is thrown on the shaved skin of rats. This is of such intensity that the pain causes a reflex twitch of the skin in an average of approximately 3.5 seconds. Stimuli lasting as long as 15 seconds may be used, but longer than this causes damage to the skin. By mathematical analysis of the data on many hundred observations it was demonstrated that a prolongation of the average twitch time to 4.0 seconds would have more than a 40 to 1 chance of being the result of a true increase in the pain threshold. When the heat was applied for periods longer than the 4 seconds the responses became less regular. Therefore, in our procedure, a 4 second stimulus is applied to the skin of a group of rats and the proportion responding with a twitch is recorded. The measurements are made exactly 30 minutes after the subcutaneous injection of graded series of doses of the drug under study, or after other time intervals when duration of effect is being studied.

In Figure 2 are summarized graphically the responses to Demerol and methadone in comparison with morphine. The figure shows the percentage of

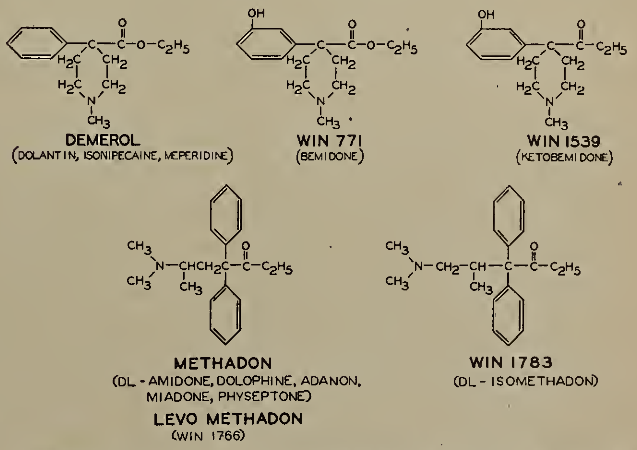

Figure 1.—Structural formulae and synonymous names of some of the new synthetic analgesics.

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*A preliminary report of these studies was presented before the Puerto Rico Medical Association, Santurce, P. R., December, 1947.[68]

[†]Winthrop-Stearns, Inc., trade-marked name for compound known also as meperidine or isonipecaine.

Presented before the section on Anesthesiology at the 77th Annual Session of the California Medical Association, San Francisco, April 11-14, 1948.

From the Sterling-Winthrop Research Institute, Rensselaer, New York.

animals which did not respond to the heat stimulus after they had been given various doses of the three analgesics. The subcutaneous dose which is required to prevent the response to this pain stimulus in one-half the rats was 0.48 mg. of methadone, 1.65 mg. of morphine, and 7.4 mg. of Demerol per kilogram of body weight. This gave methadone a potency 3.4 times that of morphine and 15 times that of Demerol, according to this test.

However, other workers, using different criteria and different methods, found morphine to be a more potent analgesic than it was found to be in these studies. This resulted in somewhat lower potency ratios for methadone and Demerol when compared with morphine. Thus Bliss and Sevringhaus[8a] analyzed the results of a collaborative study in which several laboratories participated and found that the average results of all collaborators indicate that methadone is about 30 per cent more potent than morphine in animals. There was no general agreement as to the relative potency of Demerol, the various values ranging from 5 to 45 per cent of the potency of morphine.

A comparison of the potency of morphine, codeine and Demerol in human subjects was carried out in this laboratory, but not previously published, by Barlow. In 16 experiments he measured the changes in pain threshold to a heat stimulus after giving intramuscularly 17 mg. of morphine, 22 mg. of codeine and 50 to 125 mg. of Demerol. His average results are charted in Figure 3. In the doses used, Demerol appeared to be a more potent analgesic than codeine. It did not cause quite so great an increase in the pain threshold as morphine, but tended to be more persistent in action.

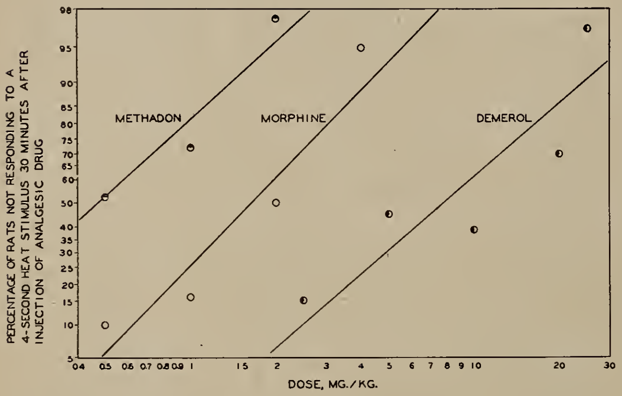

Figure 2.—Comparison of the analgesic power of Demerol, methadone and morphine, as tested by the proportion of rats responding to a 4-second heat stimulus to the skin 30 minutes after subcutaneous injection of graded doses of the three analgesics.

Other values on relative analgesic power have been reported by a number of groups of investigators. Some of the more important of these are summarized in Table 1. There is general agreement that morphine is effective in about one-tenth the dose required for Demerol and that methadone is more powerful than either.

OTHER PHARMACODYNAMIC PROPERTIES

The acute toxicity of these three analgesic drugs has been determined by a number of workers in several species of animals and by various routes of administration. A portion of these toxicity findings has been summarized in Table 2. Comparison is not possible for all routes of administration in all species because of the incompleteness of the data. However, in the data on intravenous injections in mice, which are most complete, Demerol has an average LD_{50} of 48.4 mg. in comparison with 15.8 mg. for methadone and 171 mg. per kilogram for morphine. Demerol by this test appears to be 3.5 and methadone 10.8 times as toxic as morphine.

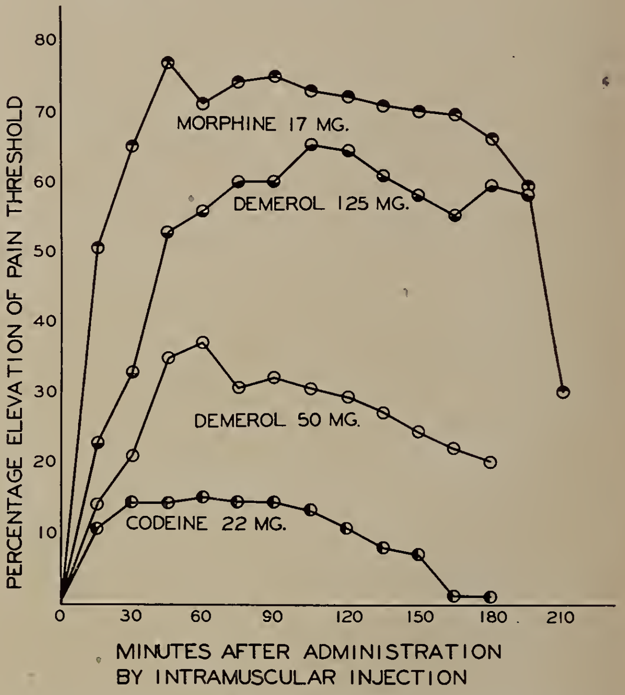

Figure 3.—Comparison of analgesic power of morphine, Demerol, and codeine in human subjects when tested by the pain threshold of the skin to heat stimuli. The curves are the averages of 16 experiments.

TABLE 1.—*Comparison of the Analgesic Power of Demerol, Methadone and Morphine as Reported by Various Investigators*
(The numbers in parentheses give the reference for each group of results)

	Ratio of Activity	Activity Ratio in Terms of Morphine	Threshold Doses						
			Rats, mg./kg.		Dog mg./kg.	Man, mg.			
Compound	(45)	(69)	(62)	(53)	(62)	*	(62)	(29)	(37)
Morphine	....	1.0	....	1.65	....	....	....	7.5	10
Demerol	1	0.05–0.07	8	7.4	10	<50	100–150	75	......
Methadone	5–10	2.2	1	0.48	1	....	5	7.5	2.5

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*Data from Figure 3.

There are very marked species variations in acute toxicity data. As an example, the lethal intravenous dose of morphine per kilogram of body weight for a mouse is so large that the dose for a one kilogram mouse would be very likely also to kill an 80 kilogram man. Therefore, the importance of these figures should not be overemphasized, particularly by trying to apply them rigidly to anticipated clinical toxicity.

A serious drawback with morphine is that it depresses respiration to an important degree. This is the feature of morphine action which most often limits the dose that can be administered with safety. In experimental animals methadone (and Demerol to a much lesser degree) can be demonstrated to depress both the circulation and the respiration. However, very large doses are required, much beyond those needed clinically. This depression is characterized by tachyphylaxis; that is, a marked effect is seen from the first dose, but progressively smaller changes are produced as the drug administration is repeated.

In Figure 4 are depicted the results in two experiments conducted by Luduena, in such a way as to illustrate these depressant effects at their maximum.[53] The experimental animals were dogs anesthetized to deep surgical anesthesia with pentothal and barbital intravenously. In the upper pair of

Table 2.—*Acute Toxicity of Analgesic Drugs in Mg. per Kilogram*
(The numbers in parentheses refer to the authors in the references)

	Mice				Rats				Rabbits		
	Intravenous	Intraperitoneal	Subcutaneous	Oral	Intravenous	Intraperitoneal	Subcutaneous	Oral	Intravenous	Oral	Intramuscular
Demerol	32.0 (32)		150 (18)	221 (25)		93 (25)			20 (25)	700 (18)	
	40.8 (62)		152 (32)	356 (32)					30 (18)		
	48 (52)										
	49.7 (62)										
	60 (18)										
	60 (69)										
Methadone	12.5 (69)	44 (32)	18 (32)	140 (32)	9.2 (26)		100 (26)	95 (26)	7.6 (32)		26.8 (32)
	13 (32)	29 (41)									
	17.3 (62)										
	20.6 (62)										
Morphine Sulfate	171 (32)	400–500 (65)			237 (26)		200–600 (49) 572 (26)	905 (26)	190–661 (49)	800–1000 (49)	

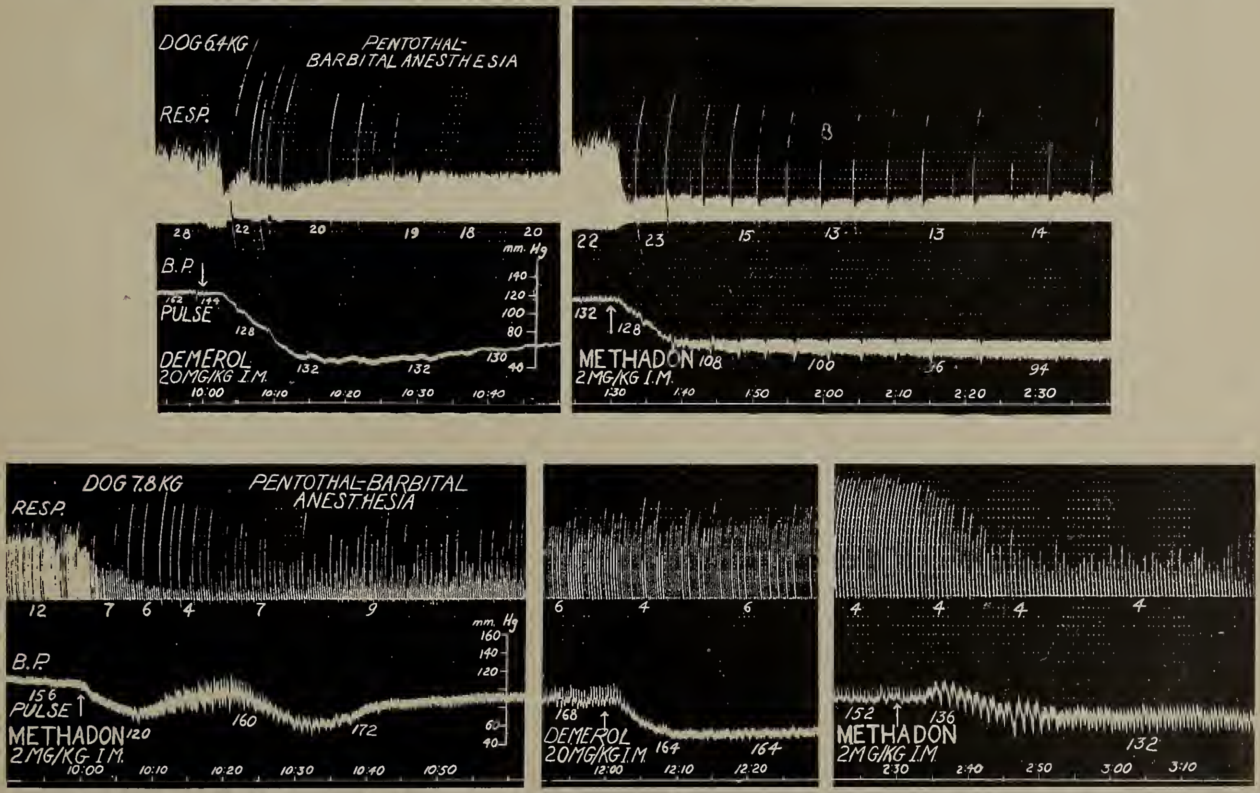

Figure 4.—Comparison of the respiratory and circulatory effects of Demerol and methadone in anesthetized dogs upon intramuscular injection.

tracings (Figure 4) Demerol given intramuscularly, 20 mg. per kilogram of body weight, caused a decrease in the blood pressure from 120 mm. of mercury to 50 mm. This was accompanied by only moderate slowing of the pulse, and hence was not a vagus effect. At the same time respirations decreased from 28 to 18 per minute and the amplitude was approximately halved. Recovery from these Demerol effects began in 20 minutes and was gradual but complete. Three and one-half hours after the Demerol, methadone in one-tenth the dose (2 mg. per kilogram) was given to the same dog. Respiration dropped in volume to less than one-third the previous amplitude, and the rate fell from 22 to 13 per minute. At the same time the blood pressure dropped to near shock level and showed no tendency to recover for well over an hour after the time of injection. This experiment illustrates that methadone is more depressant than Demerol, especially on respiration, even when given in only one-tenth the dose.

The lower series of the tracings in Figure 4 shows the salient responses of a second dog under similar anesthesia. Here the order was reversed so that methadone was given before Demerol, but again in only one-tenth the dose. The record clearly shows how both doses of methadone markedly reduced the amplitude and rate of respiration, whereas Demerol had substantially no effect on this function.

This comparative freedom of Demerol from respiratory depressant actions is important in that it allows large enough doses to be used to control pain under conditions such as those in obstetrics and surgical operations in which it is important that respiration not be depressed.

In studies on human subjects, Isbell and the group at Lexington have found that single doses of methadone administered to former morphine addicts cause significant decreases in the respiratory rate, pulse rate, rectal temperature and systolic blood pressure. Doses of 10 to 30 mg. of methadone subcutaneously had no significant effect on the electrocardiograms, and 60 to 75 mg. in divided doses had no significant effect on the blood sugar levels. Doses of 30 to 75 mg. always produced sedation in former morphine addicts and the electroencephalographic pattern was sometimes shifted to the slow side. Thirty milligrams of methadone subcutaneously regularly produced euphoria in these former morphine addicts, while 10 to 30 mg. given intravenously induced intense euphoria. Isbell concluded that serious toxic reactions should not occur with dosages used in clinical practice, but that the side effects might be expected to be similar to those produced by morphine. Denton and her co-workers at Harvard[14] reported that methadone and Demerol had similar and equal side effects when given subcutaneously to normal young men at a dosage ratio of 10 mg. of methadone to 15 mg. of morphine per 150 pounds (68 kilograms) of body weight. Both drugs produced a statistically significant depression of the respiratory rate and a slowing of the pulse rate. No significant changes were observed in the blood pressure.

Knowledge of other pharmacodynamic properties of methadone is growing rapidly. Karr[42] has found that methadone has a more pronounced inhibition of intestinal motility than Demerol, and Uchiyama, Kirchhof and David[44] report that methadone and Demerol have approximately equal spasmolytic activity on isolated strips of rabbit intestine. The two drugs had equal spasmolytic action on the contracted rat uterus, but Demerol appeared to be slightly more potent in rabbit uteri tests. Everett[20] has recently reported that methadone is a much more potent local anesthetic than Demerol when tested by the rabbit cornea and human intradermal wheal tests. However, the irritant properties of both drugs preclude their practical use as local anesthetics. Other recent reports on methadone include Elliott's studies on the respiration of rat brain and liver and kidney slices,[2, 19] Abreu's work on cerebral blood flow and oxygen uptake in human subjects,[1] Bernheim's report on brain cholinesterase,[16] Wikler's study on the nervous system of cats and dogs,[72] the work of James and Page on the respiration of human placenta,[40] and the studies of Shideman,[64] Leimdorfer,[51] and Buell and co-workers.[11]

Apparently both methadone and Demerol are metabolized to a large extent in the human body. Scott and Chen[62] found that 20 to 35 per cent of a 5 to 7.5 mg. oral dose of methadone is excreted within 24 hours. Cronheim and Ware[13] have recently reported that after the subcutaneous injection of 10 mg. of methadone only 6 to 13 per cent is excreted in about two days. There was no evidence that a conjugated form of methadone is excreted in the urine. These values for methadone agree fairly closely with those reported for Demerol by Lehman and Aitken,[50] who found that only 5 to 20 per cent of the orally or subcutaneously administered Demerol is excreted in the urine in 24 hours. The disposition of the remaining 70 to 80 per cent of both methadone and Demerol is still unknown.

CLINICAL COMPARISON

It is very difficult to get a satisfactory comparison of Demerol and methadone in various therapeutic uses, because the literature on methadone is not yet extensive, and adequate reports of a direct comparison of the two drugs under controlled conditions are just beginning to be published. Many authors have reported their clinical impressions of the value of Demerol* and methadone† by enumerating the cases where they gave complete relief, partial relief or were ineffective and unsatisfactory. Those figures which lent themselves to such tabulation have been gathered together in Table 3. These comprise, especially for Demerol, only a small part of the total number of patients reported, since the responses in many series were not classified so as to permit a summary in this form.

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*References: 4, 5, 6, 9, 12, 21, 23, 27, 28, 31, 33, 55, 58, 59, 61, 68.

†References: 7, 8, 10, 24, 39, 43, 47, 54, 57, 63, 66, 67, 68, 70.

Table 3.—*Statistics on Clinical Effectiveness of Demerol and Methadone Summarized from Published and Unpublished Reports*

	Demerol				Methadone			
Condition	Total No. Cases	Complete Relief	Partial Relief	Ineffective	Total No. Cases	Complete Relief	Partial Relief	Ineffective
Surgical operation	20	20	....	....	126	109	13	4
Preoperative	168	126	37	5	57	35	15	7
Postoperative	1073	903	62	108	426	300	92	34
Orthopedics	15	10	2	3	147	70	40	37
Arthritis, etc.	270	224	35	11	97	57	19	21
Fever therapy	22	22	....	....	....	....	....	....
Poliomyelitis	....	....	....	....	9	8	1	....
Neurology	40	28	10	2	68	46	16	6
Headache	18	13	2	3	60	39	12	9
Cardiovascular pain	15	10	4	1	18	14	2	2
Pleurisy	12	8	2	2	22	22	....	....
Gastrointestinal colic, etc.	26	19	6	1	33	23	8	2
Gallbladder colic	6	4	1	1	....	....	....	....
Renal colic	6	6	....	....	7	6	....	1
Malignancy	4	3	1	....	225	146	43	36
Obstetrics	1514	946	229	339	200	88	48	64
Cough	....	....	....	....	19	16	2	1
Miscellaneous conditions	15	9	4	2	297	150	87	60
Total cases	3224	2351	395	478	1811	1129	398	284
Total in percentage	....	72.9	12.2	14.9	....	62.3	22.0	15.7

The dominant indication for the use of both these drugs is pain, but there are differences dependent on the causation of the pain. Demerol is likely to be more useful in any painful condition induced by spasm of a smooth muscle organ. Thus, in colic of the gastro-intestinal or genito-urinary tracts Demerol will bring relief not only by deadening the perception of pain impulses but also by decreasing the spasms of smooth muscle in which they originate.[79‡] On the other hand, methadone is just as effective in those pains associated with trauma, surgical operations, and malignancies.

For preoperative use methadone is not recommended. It will minimize pain associated with operations, but it has inadequate sedative effect,[63] so that it must be combined with barbiturates, avertin or scopolamine, if the patient is to be spared unnecessary apprehension and psychic trauma. In contrast, Demerol has enough sedative action that the importance of these supplementary drugs is diminished to the point where they are not usually needed.

Postoperatively Demerol appears to be somewhat superior to methadone; the tabulated data of Table 3 show that Demerol was completely satisfactory in 84 per cent of the postoperative cases as compared with only 70 per cent for methadone. Probably the weak sedative action led to less than complete satisfaction with methadone in a percentage of the patients after operations.

In obstetrics Demerol holds a decisive margin. Thus pain was completely controlled by Demerol in 62 per cent of the cases summarized, with only 22 per cent of unsatisfactory cases. In contrast methadone was completely effective in only 44 per cent of the cases, and failed in 32 per cent. The relatively poor performance of methadone in obstetrics may be ascribable either to its respiratory depression, which limited the doses tolerated by both mother and child, to its lack of sedative power, or to inadequate spasmolytic action. It is interesting to note that Demerol facilitates dilatation of the cervix in many cases by relieving spasm of the cervix and enhancing uterine motility.

The striking amount of analgesia which Demerol produces without simultaneously inducing significant degrees of respiratory depression is a combination of qualities which is of life-saving importance in obstetrics, where so often a child's life is endangered by depression of its respiratory center from the sedative and analgesic medication of the mother. In fact, in both the United States and Great Britain Demerol is very widely used in obstetrics and is designated the drug of choice by a number of leading obstetricians.

Several workers, both in this country and in England, have recently urged caution in the use of methadone in obstetrics. Barnes and co-workers[3] conclude that methadone is a greater respiratory depressant than Demerol and that it presents a measurable hazard to the baby when used during labor. Lund[54] found that mild asphyxia occurred more frequently than usual after the use of methadone. Steel and Gunderson,[67] reporting that 28 per cent of the infants delivered under methadone analgesia showed respiratory depression, suggested that methadone will have to "find a place in fields other than those of obstetrical analgesia." Prescott and Ransom[57] report that Demerol is used routinely in the obstetrics department of University College Hospital in London. These workers tried methadone in 62 cases and found that it relieved the pains of labor as well as did Demerol, but that it had a much more depressant effect on the babies. They reached the

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[‡] Gaensler et al.[22] have recently reported that Demerol is spasmogenic in its action on the sphincter of Oddi, comparable in degree between that caused by codeine and morphine.

conclusion that methadone is not safe in obstetrical practice and recommended that it not be used as an analgesic in labor.

Methadone depresses the cough reflex; this is done to only a minor degree by Demerol. As a result methadone is useful for controlling coughs associated with pain or those without pain.[10, 47] On the other hand, where preservation of the cough reflex is desirable, such as in surgical cases and particularly in elderly or bedfast patients postoperatively, methadone should be avoided and Demerol preferred.

SIDE EFFECTS

With drugs as potent as these for depressing certain aspects of central nervous system activity some side effects are to be anticipated. With Demerol these have not been serious and rarely limit the use of the drug. The most common is a sensation of "light headedness" or some related manifestation of temporary cortical disorganization. This is often lost after the drug has been given a few times. Nausea and vomiting may occur in a small proportion of patients but are less frequent than with morphine. In ambulatory patients these responses are more pronounced and frequent. They generally may be controlled by using small doses at first, which are increased as tolerance develops. Branwood carefully analyzed the circulatory effects of Demerol[9] and recorded decreases in blood pressure which would in large part explain many of the reported side actions. Another important evaluation of the side effects of Demerol was that of Hecht and co-workers.[27]

Methadone appears, from the incomplete evidence so far available, to be more likely to cause side effects than Demerol. Bercel[8] reports the use of methadone in 25 patients suffering from a variety of ailments but all having pain as their common characteristic. Ten of the patients or 40 per cent complained of side effects, the most common of which was dizziness and nausea. In five cases or 20 per cent the reactions were so severe that medication had to be discontinued. He concluded that, case for case, methadone is more toxic than Demerol or morphine, that there is a definite sensitivity to the drug and that skin tests are advisable. Bryan and Smyth[10] observed side reactions in only five of 72 patients receiving 5 to 17.5 mg. of methadone subcutaneously. On the other hand the oral administration of 2.5 mg. of methadone caused untoward reactions in nine of 22 patients, and 10 mg. of methadone administered orally caused "severe toxic reactions" in eight of nine patients. These observers conclude that methadone is a satisfactory analgesic when administered subcutaneously but that its oral use is not recommended because of the frequency of undesirable side reactions.

Batterman and Oshlag[7] have recently reported that they find methadone to be limited in its clinical usefulness because of the high incidence of untoward reactions. They observed side actions in 38 per cent of their 185 patients, as is summarized in Table 4. They observed an incidence of such reactions in 80 per cent of the ambulatory patients, after oral administration. In over half of this 80 per cent the reactions were considered by them to be of marked severity, as the table indicates. The incidence was least in the bedfast patients receiving injections, but even here was 23 per cent of the total.

Also of interest is the kind of side effects which are summarized in Table 5. After oral administration, dizziness was almost always observed, with an associated high incidence of drowsiness and weakness. Nausea occurred in 40 per cent of those getting the drug orally and this went to the stage of vomiting in 18 per cent. The frequency and severity of these reactions were greatly reduced in hospitalized patients. As a result of these experiences, Batterman is quite conservative in his appraisal of the clinical value of methadone.

Since difficulties of this magnitude apparently have not been experienced by Kirchhof and David,[43] Troxil,[70] Lundy,[24] and others,[39, 62] it would seem best to withhold judgment on the significance of the

Table 5.—*Percentage Frequency and Varieties of Side Effects from Methadone as Observed by Batterman and Oshlag*[7]

	Hospitalized Patients		Ambulatory
	Parenteral Route	Oral Route	Patients by Oral Route
Kind of Side Effect	%	%	%
Dizziness	11.1	20.0	70.0
Nausea	4.4	15.4	40.0
Vomiting	3.3	4.6	18.6
Diaphoresis	5.5	9.2	18.6
Epigastric pain	......	1.5	......
Dryness of mouth	1.1	4.6	3.3
Anorexia	2.2	9.2	10.0
Pruritus	......	1.5	6.6
Weakness	......	12.3	23.3
Headache	2.2	3.2	10.0
Drowsiness	5.5	13.8	33.3
Grogginess	3.3	4.6	6.6
Miosis	2.2	4.6	......
Urinary retention	......	1.5	......
Visual disturbances	......	4.6	6.6
Mental confusion and toxic psychosis	1.1	9.2	......
Numbness	......	......	6.6

Table 4.—*Incidence and Severity of Side Effects from Methadone in Patients Treated Parenterally and Orally*
(Data of Batterman and Oshlag[7])

		Patients with Side Effects		Severity of Side Effects					
				Marked		Moderate		Mild	
Route of Administration	No. Patients	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Parenteral in hospitalized patients	90	21	23.3	1	4.8	4	19.0	16	76.2
Oral in hospitalized patients	65	26	40.0	12	46.1	8	30.8	6	23.1
Oral in ambulatory patients	30	24	80.0	13	54.1	4	16.6	7	29.1
Total	185	71	38.4	26	36.6	16	22.5	29	40.8

side effects of methadone until such time as extensive reports based on experienced use of the drug in larger series have been published.

LIABILITY TO ADDICTION

Both Demerol and methadone have been placed under the restrictions of the Harrison Narcotic Act in the United States by action of the Federal Bureau of Narcotics. Therefore, they can be dispensed and used only in accordance with the regulations governing the opiates.

There is no doubt that Demerol has given rise to physiologic or psychologic dependence on the drug. However, the number of previously normal people who have been stated to have become Demerol addicts is low in view of the extremely wide use of the drug in chronic painful conditions and the millions of doses administered each year. Withdrawal of the drug after habit formation causes withdrawal symptoms of the usual types.

The addiction propensities of Demerol have been evaluated by Batterman,[4] Himmelsbach,[30] and Noth,[55] and in a statement of the Council on Pharmacy and Chemistry of the American Medical Association.[77] There would seem to be substantial agreement that addiction liability with Demerol is of sufficient importance to justify taking every reasonable precaution against inducing addiction to it.

Experiments in animals and human subjects have led Eddy[17] and Isbell, Wikler, Eddy *et al*[34-38] to classify methadone as having "definite addiction liability" and as being "dangerous with respect to habituation." Wikler[71, 73] has shown that intact, decorticate, decerebrate and spinal dogs develop tolerance to various effects of methadone as rapidly as to morphine if several doses are given daily. All of these dogs developed dependence upon methadone more rapidly and more intensely than on morphine, so that when the drug was stopped after a month or more of administration a definite and intense abstinence picture appeared within a few hours. Phatak and co-workers[56] have made use of Ro's hyperglycemic withdrawal response for estimating addiction potentialities. In their studies the withdrawal of methadone was essentially the same in its effects upon the blood sugar response as the withdrawal of morphine, while the effect of Demerol withdrawal was much less.

In contrast to these findings, Woods, Wyngaarden and Seevers[75] report that the chronic daily subcutaneous administration of methadone to monkeys does not lead to a condition of physical dependence as is noted with morphine.

Isbell, Wikler, Eddy and co-workers[36] have recently summarized their work on the addiction liabilities of methadone in human subjects. These workers found that methadone given subcutaneously four times daily in increasing amounts up to 100 to 200 mg. per dose to former morphine addicts produced the typical clinical picture of narcotic addiction. These subjects showed a distinct euphoric reaction to methadone which they described as entirely comparable to that of morphine, heroin and related substances. However, the dose required to produce this euphoric reaction and addiction was much larger than the usual analgesic dose of clinical practice.

Abrupt withdrawal of methadone from men who had received the drug for one to six months caused a mild but definite abstinence syndrome. These signs of abstinence developed more slowly than after morphine, and the symptoms were so mild that they barely reached significant levels when measured by the Himmelsbach scoring system.[48]

Isbell and co-workers have further shown that methadone can be substituted for morphine smoothly and completely in a known addict, preventing entirely the abstinence phenomena which would otherwise develop when morphine is withdrawn. Definite evidence of euphoria and of satisfaction with subjective effects were seen after the administration of doses of 10 mg. or more of methadone to former morphine addicts.

When methadone has been used for the relief of clinical pain, euphoria has rarely been seen in patients not previously addicted to morphine, and only a few cases indicative of possible addiction have been reported. Isbell and co-workers[36] report that in the treatment of more than 500 patients for the relief of pain not a single euphoric reaction was observed. Mild signs, possibly indicative of developing physical dependence, were seen in only two cases. Other clinicians[43, 70] who have used methadone in non-addict patients have been impressed by the relative freedom from addiction symptoms on withdrawal. However, the importance of addiction danger to this drug obviously cannot be finally determined until much wider clinical experience has accumulated from at least several years of intensive use.

THE FUTURE

Demerol and methadone are by no means the only interesting drugs in these chemical families. In Figure 1 others are shown, and still others of equally high and unique potency are known. These new drugs are still in the experimental stage, so that their eventual importance cannot now be predicted. However, it would be strange if eventually better compounds than those which broke open this field were not discovered. Therefore, the next few years promise to be unusually fruitful in uncovering new and better drugs for the abolition of pain.

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CASE REPORTS

- Subarachnoid Hemorrhage Subsequent to Injection of Epinephrine
- Acanthosis Nigricans with Unusual Cutaneous and Clinical Features
- Ruptured Mucocele of the Appendix with Pseudomyxoma Peritonei, Simulating Pseudomucinous Cystadenoma of the Ovary

Subarachnoid Hemorrhage Subsequent to Injection of Epinephrine

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An instance is reported of subarachnoid hemorrhage in a middle-aged male during an acute asthmatic attack while under treatment with repeated subcutaneous injections of epinephrine.

CASE REPORT

The patient, aged 56, entered Samuel Merritt Hospital on October 28, 1946, complaining of slight difficulty in breathing, headache and low back pain. For 15 years he had suffered from perennial recurrent attacks of bronchial asthma, characterized by severe wheezing, shortness of breath, paroxysmal coughing and expectoration of tenacious mucoid sputum. He first came under the treatment of one of us (A.H.R.) in September, 1946, at which time a cereal-free elimination diet (Rowe) 1, 2 and 3 was prescribed and the patient was advised to use tedral tablets and a 1:100 epinephrine nebulizer for symptomatic relief. Initially there was improvement, but ten days prior to admission he was placed in another hospital because of a severe asthmatic attack which followed the unintentional ingestion of milk and wheat. Treatment consisted of the establishment of a dust-free environment, continuation of the diet and subcutaneous injections of 1:1,000 epinephrine in doses of from 0.5 cc. to 0.7 cc. every four to five hours.

Nine days prior to entry, while in the former hospital, a subcutaneous injection of 0.7 cc. of 1:1,000 epinephrine was given. Immediately after the injection the patient complained of severe tremor, rapid heart action and weakness and told a nurse that epinephrine had never previously had such effect. Within five or six hours after this injection the patient noted the gradual onset of lumbar backache, occipital headaches and malaise. These symptoms were persistent and were partially relieved by codeine and aspirin and changes of position. The severe asthma subsided and he was discharged on the fifth day with only slight difficulty in breathing, but still complaining of backache, headache and malaise. During the next five days there was further decrease in asthma, but headache and backache increased. On the day of admission to the hospital severe asthma developed and the headache and backache increased markedly.

System Review: A diffuse papular eruption had developed following the administration of a saturated solution of potassium iodide three weeks prior to entry. There had been rare frontal headaches of brief duration throughout the patient's life and for ten to fifteen years he had noted frequent pains in the elbows, knees and lower back. Sour stomach and gaseous eructations following the ingestion of fruits had been experienced for many years. For one month prior to entry he had complained of nocturia, burning and frequency of urination.

The medical and family history were non-contributory.

Physical Examination: On entry, blood pressure was 150 mm. of mercury systolic and 90 diastolic, pulse was 68, respirations 16 per minute, and temperature 98.6° F. The patient was a well developed, well nourished, middle-aged white male who lay quietly in bed and seemed moderately depressed. Positive findings included slight limitation of neck flexion to approximately 30 degrees, beyond which point pain and rigidity in the posterior nuchal muscles were produced. Retinal arteries showed sclerotic changes, grade II. Both lung fields were hyperresonant and wheezes on prolonged expiration were generally audible. A right indirect inguinal hernia was present. The prostate was enlarged and tender with a palpable firm nodule in the upper aspect of the left lobe. Straight leg raising bilaterally caused low back pain. Abdominal, cremasteric, patellar and achilles reflexes were absent. The examination was otherwise negative.

Hospital Course: The day following entry increased neck stiffness was noted and nausea and vomiting developed. Because of persistent vomiting glucose and saline solutions were given intravenously as necessary. On the third hospital day the patient complained of double vision. Neurological examination did not elicit additional findings. A urologist found chronic prostatitis and prostatic hypertrophy, grade III. By the fourth day stiffness of the neck and double vision were more pronounced. Lumbar puncture revealed grossly bloody fluid which was xanthochromic after centrifugation. Initial pressure was 280 mm. of water. Result of the Queckenstedt test was normal. Following lumbar puncture there was immediate partial relief of the stiff neck and back pain with increased range of neck flexion. Two days later fever (maximum 101° F.), present since entry, disappeared. On the fifth day the neurologist confirmed the diagnosis of subarachnoid hemorrhage. He found definite impairment of the function of the right external rectus muscle with poor conversion. During the following six days there was a gradual disappearance of symptoms with a return of the patient's normal mental status. Lumbar puncture on the eleventh hospital day revealed no blood, but xanthochromia persisted. The pressure was 160 mm. of water. During hospitalization the asthma rapidly disappeared. The patient was discharged symptom-free on the 16th day.

Subsequently he was seen at monthly intervals for eight months, and there was no return of symptoms referable to the central nervous system. In January, 1947, the inguinal hernia was uneventfully repaired under spinal anesthesia.

Laboratory and X-ray: A roentgenogram of the chest taken prior to entry revealed minimal parenchymal changes

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suggestive of silicosis. Examination of the urine showed specific gravity of 1.022, no albumin or sugar, and a diacetic acid content of 3 plus. Examination of the blood showed a hemoglobin value of 93 per cent. Erythrocytes numbered 4.67 million and leukocytes 9,600. Results of a Kline test were negative. The erythrocyte sedimentation rate (Linzenmeier method) on the seventh hospital day was 18 mm. in more than two hours. On the eighth day the acid phosphatase was 0.2 unit. Roentgenograms of the skull taken on the tenth day showed no evidence of pathologic changes. Roentgenograms of the lumbar and sacroiliac spine showed marked narrowing of intervertebral discs between the body of the fifth lumbar vertebra and the sacrum, and there were moderate osteoarthritic changes involving the lower thoracic and upper lumbar vertebral bodies.

DISCUSSION

Flexner and Schneider[1] in 1938 first reported subarachnoid hemorrhage following the subcutaneous injection of a single dose of 1:1,000 epinephrine in a 20-year-old woman suffering from urticaria, 14 days postpartum. Delivery had been performed with low forceps, but was uneventful. They postulated that if a congenital aneurysm were present, it may have been weakened by the strain of labor and that a possible sudden rise in blood pressure with increased cerebral circulation volume and velocity following the injection of epinephrine was sufficient to cause rupture of the aneurysm. The possibility that some epinephrine entered the venous circulation was also considered. These authors also reviewed the literature dealing with the effects of epinephrine on the cerebral circulation.

We believe that in our patient the subarachnoid hemorrhage probably resulted from the entrance of some of the subcutaneously injected epinephrine into the venous circulation. This was indicated by the severe tremor, tachycardia and weakness which immediately followed the injection of epinephrine on the ninth day prior to admission. The subsequent train of symptoms, physical findings and laboratory findings was typical of subarachnoid hemorrhage. The neurological findings indicated that the hemorrhage probably occurred from a vessel at the base of the brain. The presence of a congenital aneurysm or area of decreased resistance secondary to arteriosclerotic changes in the basilar vessels must be considered. With such an area of decreased resistance the sudden rise in blood pressure with increased cerebral circulation volume and velocity might have been sufficient to cause rupture and hemorrhage into the subarachnoid space.

SUMMARY

An instance of subarachnoid hemorrhage in a middle-aged male during an acute attack of bronchial asthma treated by repeated subcutaneous injections of 0.5 cc. to 0.7 cc. of 1:1,000 epinephrine is reported. We believe that hemorrhage probably resulted from entrance of some of the subcutaneously injected epinephrine into the venous circulation.

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Acanthosis Nigricans with Unusual Cutaneous and Clinical Features

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ALMOST from its earliest recognition acanthosis nigricans has been associated with the problem of malignancy. In this country we automatically assume the juvenile type to be benign and the adult type to be associated with a malignant neoplasm. Some of the European observers apparently do not hold this view, but feel that a large percentage, even of the adult type, is of a benign character.

The customary course of acanthosis nigricans is to develop increased markings of the skin up to the formation of verrucae and even peduncula in the various folds of the body such as the neck, axillae, and groins, usually associated with papule formation to a moderate degree in other areas. Mostly the skin manifestations are in evidence a considerable time before the patient complains of systemic symptoms. This time interval may be a considerable number of years and usually the course of events is chronic, which probably accounts for the discrepancy among views as to the etiologic nature of the disease.

We shall not review the various theories evolved to explain the course of events in acanthosis nigricans since we have no definite knowledge of it. Manifestly there must be a mechanism involved that does not come to play in the ordinary case afflicted with carcinoma. In the case reported here the course of events was almost the reverse of that usually seen.

CASE REPORT

A woman, 49 years of age, was seen by us for the first time on June 22, 1945. She then presented innumerable verrucous, discrete papules over almost the entire body. There was, however, little or no acanthosis in the usual areas. While a suspicion of acanthosis nigricans could be entertained, a positive diagnosis was impossible. The papules, according to the patient, had been present for about six weeks. Family and past personal history was irrelevant. About two months before we saw her she had consulted her family physician for the first time because of obesity. Evidently, after taking a complete history and making a thorough physical examination, he found nothing of much importance and placed her on a reduction diet. During the week that elapsed before her next visit to the physician a non-productive cough had developed but it had subsided before another visit seven weeks later. At that time the physician noted a considerable growth of "verrucous masses" on various areas of the glabrous skin, and two weeks later these masses covered practically the entire skin. The patient was then referred to us late in June. We did not have opportunity to observe the patient further until late July. Meanwhile a surgeon who examined her suspected ovarian cysts. Evidently disease of the stomach was not suspected despite a complaint of much belching of gas and bad taste in the mouth. X-ray examination at that time showed a fleck of barium retention in the duodenum after six hours, which was interpreted as indicating duodenal ulcer. The surgeon, evidently impressed by the large abdominal tumor masses, removed two large ovarian tumors in July. These were pronounced metastatic carcinomas by the pathologist. We observed the patient again at the hospital on July 27, when the eruption also showed in the

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axillae with the usual discoloration but only to a moderate degree. By that time, however, the diagnosis was clear cut. The patient died November 22, 1945, about five months after the first verrucae were noted.

NECROPSY

Necropsy showed essentially generalized metastatic carcinoma. There was a carcinomatous infiltration of the stomach of the leather bottle type. The pathologist expressed the opinion that this was the primary seat of the tumor. It was of particular interest to note that despite the very diffuse metastasis, the lungs, kidneys, liver and spleen showed little involvement, whereas the left adrenal and practically all the abdominal lymph nodes showed marked carcinomatous infiltration. The left adrenal was markedly enlarged, measuring 5 by 3 by 3 centimeters. The central portion was composed of tumor tissue which destroyed the greater portion of the cortex.

COMMENT

This case was of unusual interest to us because of the rapid diffuse eruption of discrete verrucous papules over practically the entire body prior to any appreciable involvement in the classical areas such as the neck, groin, or axillae. Later, these areas showed the typical verrucous, discolored appearance, but only to a moderate degree. Also unusual was the clinical course of events in that the whole development was seemingly very explosive. Even when seen by us with a rather profuse eruption the patient was still obese despite the "leather bottle stomach" and extensive metastasis. She did not seem very ill, nor was there much complaint with reference to internal organs. Any deductions would be of a speculative character, but the course of events and the necropsy findings would seem to indicate that the primary seat of the carcinomatous change was in the stomach, and that there it involved chiefly the glandular elements. When metastases did occur, they rather early affected those factors responsible for the development of the syndrome called acanthosis nigricans. In the further spread of the metastasis again there was almost a selective involvement of lymph nodes. The cachexia of metastatic carcinoma never developed. Even at autopsy the body was reported as well nourished. This case illustrates again that a close cooperation between the dermatologist and general clinician is desirable.

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Discussion by Ernest K. Stratton, M.D., *San Francisco*

Inasmuch as I haven't seen a case of acanthosis nigricans for many years, I will make my comments brief and limit them to one phase of the hypothetical aspects of its etiology.

The etiology and pathogenesis of acanthosis nigricans are far from being understood. The fact is that some cases of the adult form (that is, the malignant type which is usually associated with abdominal carcinoma) are reported in patients in whom no evidence of malignancy is found. It is also a fact that the juvenile form (that is, the benign type in which it is rare to find an associated malignancy) is occasionally reported associated with malignancy. These observations would seem to indicate that some other factor besides the malignancy itself is responsible for the skin picture, especially when the pathological changes in the skin are the same in both types.

One sign, namely the pigmentation, was believed by Darier and others to be caused by a disturbance of the nerve supply to the adrenal glands. The splanchnic nerves, a division of the abdominal autonomic system which innervate the gland cells of the medulla, are believed to act as inhibitors of pigmentation. When this function is interfered with by pressure, either by neoplasms of the abdominal viscera or by abdominal metastasic growths, as seen in the adult cases, or by the pressure of such conditions as congenital malformations, peritoneal adhesions and benign growths, as seen in the juvenile cases, paralysis of these nerves results and a hyperpigmentation follows.

Even if the pigmentation could be explained with such a theory, how could one account for the hyperkeratosis, the acanthosis and other aspects of the syndrome? Avitaminosis associated with malignancy might be one explanation. (As in Hollander's case).

Ruptured Mucocele of the Appendix With Pseudomyxoma Peritonei, Simulating Pseudomucinous Cystadenoma of the Ovary

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This is the report of a case of ruptured mucocele of the appendix with marked generalized pseudomyxoma peritonei, simulating that associated with pseudomucinous cystadenoma of the ovary. This case is remarkable in that the mucus, instead of being confined to the vicinity of the appendix and cecum in a mass, was found throughout the abdominal cavity in large amounts.

Foot describes the mucocele as arising in an appendix that has been acutely inflamed, with cicatrization causing proximal occlusion and the sealed off distal part turning into a simple pouch. Mucus continues to be secreted into this pouch, and the secretion becomes inspissated and gelatinoid. The pouch, becoming distended, ruptures and its contents spill into the peritoneal cavity with resulting production of numerous deposits of mucus secreting cells that resemble those of pseudomucinous adenomas of the ovary. Although appendiceal mucoceles are usually not very large, some have been reported as enormous.

In the presence of mucus deposits the peritoneum usually shows signs of reaction to irritation. A fine pellicle of fibrin forms over the mucoid material, and fine fibrous septa develop, which at times makes removal difficult.

CASE REPORT

The patient, a 62-year-old white married female, was first seen because of complaint of epigastric distress and soreness in the lower abdomen on the right side of one week's duration. The patient felt nauseated but did not vomit. She was constipated, had poor appetite and said that she had been very nervous and in the past year had been given considerable sedatives. There was no history of operations or of serious illness or injury.

The skin and mucous membranes seemed somewhat drier than normal. The temperature was 99.2° F., the pulse rate was 90 and the blood pressure 180 mm. of mercury systolic, and 90 mm. diastolic. No cardiac abnormalities were noted. There were no palpable masses in the abdomen. Very slight rigidity was noted in the right lower quadrant of the abdomen and there was moderate tenderness in that area, but no rebound tenderness. Rectal examination revealed tenderness high on the right side. On pelvic examination the uterus was found to be retroverted but normal in size. Adnexa were normal. The cervix was slightly eroded.

Examination of the blood showed hemoglobin 81.5 per cent. Erythrocytes numbered 3.93 million and leukocytes 7,400 with normal distribution of polymorphonuclear cells, lymphocytes, stabs and segmented cells. A Wassermann test was negative. Results of urinalysis were normal.

At operation the peritoneum and serosal surface of the small and large bowel and pelvic viscera were injected and covered with a fibrinous membrane. There was a large amount of gelatinous material present throughout, but mainly located in both lower quadrants, deep in the pelvis. A large mass of this substance was present in the right lower quadrant at the base of the cecum. The appendix 3 cm. from the cecum entered a globular mass measuring 6 x 3 cm. which was hard, and whitish in color. In the lower portion of it was a hole 1½ cm. in diameter, out of which exuded gelatinous material. This mass lay retrocecal and was bound down to the posterior aspect of the cecum by dense adhesions. Both ovaries were small, fibrotic, and intact. The Fallopian tubes and uterus appeared normal except for serosal injection as mentioned.

The appendix, with the mass, was removed, as was the gelatinous material from the rest of the abdomen.

Pathological Report: The gross specimen was a tubular mass 5.2 cm. long and 2.4 cm. wide. It was closed at one end, which was blunt, and was clamped at the other end. The outer surface was opaque and consisted of friable, yellow-white tissue. The tube was slightly curved and in the concavity was a 2.4 x 2.2 cm. ovoid pouch or mass, gelatinous in consistency and covered with thin gray membrane. Examination of a section showed the tubular lumen to be dilated, the wall measuring 0.3 cm. in thickness. The lumen was continuous with a cavity in the gelatinous mass, both being filled with a gray, thick, mucoid semiliquid, which was intimately adherent to the walls. Calcium or bone was present in the wall, making it firm and gritty in certain areas.

Microscopic examination showed the serosa was intact, but the subserosal connective tissue was edematous and contained numerous small and large vascular channels which were uniformly dilated and filled with red blood corpuscles. Collections of lymphocytes about some of these vessels were noted. The muscular coats of the appendix were both notably thickened but otherwise were not remarkable. The mucosa was markedly altered, there being no evidence of the lymphoid follicles. The glandular structure was somewhat effaced, and the lining mucosal cells were thrown into papillary folds and rested directly upon the described musculature. The cells composing the altered mucosa were tall and columnar, with basally placed, elongated, hyperchromatic nuclei and with overriding cytoplasm that was distended with a neutrophilic-staining material, probably mucoid.

When sections through the appendiceal wall and also through the mass that was described in its concavity were examined, the mass appeared to be continuous with the appendiceal mucosa and it consisted for the most part of irregular strings and strands and small collections of mucoid material which was neutrophilic-staining and which in some places was collected and separated from other portions by lacy, thin fibrous connective tissue strands. A few fibrocytes were noted and there were a few areas resembling cartilage. In other portions the wall contained granular plaques of deep blue-staining material which appeared to be calcium. In one portion the small tumor was ruptured and the mucoid material was pouring out through the orifice. Malignant changes were not observed. Inflammatory reaction was not a feature.

Diagnosis: Mucocele, appendix. Pseudomyxoma peritonei.

The patient made an uneventful recovery and was dismissed from the hospital on the fifth postoperative day. She has been observed about once a month subsequently and there have been no complaints of abdominal distress.

COMMENT

These rare cysts of the appendix are of interest to the surgeon because they may be the starting point of a condition of pseudomyxoma peritonei similar to that which occasionally complicates pseudomucinous cystadenomas of the ovary. Boyd states that as a result of rupture of the cyst, the contents become implanted on the surface of the peritoneum where they cause proliferation and the formation of large masses of gelatinoid material. The condition is probably due to implantation of the epithelial cells on the peritoneal surface, where they continue to produce their mucinous secretions. Another explanation is that the material irritates the peritoneum and causes it to react increasingly to further production of similar masses. At any rate, fibrous tissue proliferation in the peritoneum takes place, so that eventually it may be impossible to remove the masses.

The prognosis according to Boyd is unfavorable, but removal of the appendix may check the disease. The disease is fatal in the majority of cases, although a number of years may elapse between onset and death. Recurrence of the peritoneal reaction may be expected. Many of the patients die of sepsis and embolism.

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MEDICAL PROGRESS:

Sulfonamide Toxicity

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APPROXIMATELY ten years have passed since the introduction of the sulfonamides into clinical medicine, and during this decade tremendous strides have been made in the control of infection by chemotherapy with various members of this group of drugs and the antibiotics. At present the major interest of both the lay and professional mind in this regard is centered on the antibiotics, but there is little doubt that the sulfonamides will continue to play an important part in the treatment of bacterial infections. Therapeutic efficacy plus ease of administration and relatively low cost makes these drugs very valuable agents indeed.

The serious disadvantage of the sulfonamides is the toxic reaction which occasionally occurs during use of them. And since considerable time has elapsed since their introduction, this review is undertaken in order to present an overall evaluation of these toxic manifestations.

Such an effort seems justified by the fact that a comprehensive, up-to-date analysis of the problems of sulfonamide toxicity is not available. Spink,[74] Van Dyke,[80] and Beckman[6] have written at considerable length on the subject; but these articles are somewhat outdated by new developments, and the last rather minimizes the hypersensitive type of renal and myocardial lesion. This situation is in contrast with the large volume of writing dealing with various individual aspects of sulfonamide toxicity: over 400 papers have appeared since 1941 in the English language alone. These articles for the most part deal with isolated phases of the subject pertaining to one drug, to one specialty, or one experimental project, and nowhere is there a complete discussion of the whole problem. The present paper has been limited to developments since 1941 and to drugs which are now in clinical use: sulfathiazole, sulfadiazine, sulfamerazine, sulfacetamide, sulfasuxidine, and sulfathalidine. No space is devoted to a resumé of the history of chemotherapy, to listing priority in reporting of the various toxic reactions, or to the results of animal experimentation unless these seem particularly pertinent. No effort has been made to compile the total numbers of the various reported reactions, and the statistical approach is used as little as possible. The mere fact that a certain severe and possibly fatal reaction to a sulfonamide does occur should place the practitioner on his guard; he should not be lulled into a sense of security by the statistical infrequency of that reaction.

GENERAL CONSIDERATIONS

Before discussing specific reactions, all the possible mechanisms for untoward effects will be considered. First is the direct, immediate toxic action of the drug on the human organism. Examples of this are nausea and vomiting, dizziness and psychic aberrations, peripheral neuritis resulting from the intramuscular administration of the drug, and hematuria and possible damage to renal tubules which often accompany intravenous therapy with the sodium salts of the sulfonamide compounds.

The second and probably most important category of reactions which occur is made up of those which result from an acquired hypersensitivity to the drugs. That such reactions do occur has been established beyond reasonable doubt by clinical and experimental studies. Landsteiner[43] and Wedum[82] have shown that the various sulfonamides can be conjugated with human serum and that the resulting combination is antigenic when injected into guinea pigs. Klinge, Vaubel, Knepper and Waaler[40] have produced arteritis and collagenous and parenchymatous degeneration in sensitized rabbits by repeated injection of foreign protein. These lesions closely resemble those described in fatal sulfonamide reactions by French;[23] Lichtenstein and Fox;[47] More, McMillian, and Duff;[54] Hartroft;[31] and Black-Schaffer.[8] Rich[65, 66] feels that periarteritis nodosa may be an allergic reaction. The microscopic picture may be briefly summarized as a complex of tissue destruction and proliferation of reticulo-endothelial cells in the affected area. The allergic nature of many sulfonamide reactions has been demonstrated by appropriate patch and passive transfer tests (Weiner,[83] and Leftwich[45]), and by the interesting observations of Park who investigated 60 patients with cutaneous reactions to sulfonamides. Of these, 60 per cent were sensitive to only one drug, and 40 per cent were sensitive to more than one drug of the group and to sulfanilic acid. About half of the latter were sensitive to the sulfonamide radical and the other half to the aminophenyl group. Those patients who were sensitive to the aminophenyl complex reacted also to procaine, but no patients were found who were allergic to still smaller chemical radicals.

A third source of difficulty has been the renal damage produced by the precipitation of crystals of the administered drug and its acetyl derivative in the kidney tubules or in the extrarenal collecting system. This is a problem of simple chemical solubility and will be dealt with when the renal effects of the sulfonamides are considered in detail.

A fourth possibility which must be considered is the deficiency state resulting from the altered metabolism of vitamins due to changes in the bacterial flora of the intestine occasioned by the long continued administration of sulfasuxidine or sulfathalidine. Axelrod,[4] also Spicer, Daft, and Sebrel[73] and other investigators, have shown that leukopenia and agranulocytosis which develop in rats on sulfaguanidine or sulfasuxidine can be prevented or successfully treated with biotin, crude liver, or folic acid. It is postulated that the prolonged action of sulfaguanidine and sulfasuxidine on the bacteria in the large bowel interferes with biotin synthesis. As far as is known the results of this work have not been applied to the therapy of human beings despite the fact that agranulocytosis does occasionally occur as a result of treatment with sulfasuxidine; but this therapeutic approach is a possibility which should be considered.

Fifth and finally, there is the group of abnormalities induced in the hemopoietic system which, as Lyons has pointed out,[51] cannot be accurately classified as a result of toxic effects, hypersensitivity, or deficiency states.

One occasionally reads a statement to the effect that vitamin C is an antagonist to the toxic effects of the sulfonamides, and that ascorbic acid should be used in the treatment of all sulfa reactions. About all that can be cited to support this opinion are the few isolated case reports of patients who have developed reactions thought to be of sulfonamide origin, and who have recovered with vitamin C administration despite the continuance of sulfa therapy. Any sweeping conclusions are certainly not justified by the evidence so far presented. On the other hand, Karel and Chapman[36] could produce no reduction of toxicity by the use of ascorbic acid in some carefully controlled animal experiments. They divided a number of guinea pigs into three groups: those on a regular diet, those depleted of vitamin C, and those fortified with vitamin C. Then the dosage of sulfanilamide necessary to kill one half of these animals in both the fasting and fed state was determined. There was no difference in mortality of these groups referable to vitamin C intake.

Through one or more of the above mentioned mechanisms sulfonamides may produce toxic changes in virtually every organ in the body, and thus give rise to a wide variety of clinical manifestations. These will be dealt with individually in the form of a system review. However, it must be kept constantly in mind that the allergic process is generalized despite the fact that the clinical signs may be limited to one organ system.

IMMEDIATE TOXIC EFFECTS

These untoward results of sulfonamide administration occur early in the course of treatment—from immediately after ingestion of the drug up to three or four days. Nausea, vomiting, dizziness, headache, malaise, and psychic manifestations are most commonly noted. When the patient is hospitalized the course of therapy can usually be continued, although a toxic psychosis is potentially dangerous when the patient must be kept in an open hospital ward. However, any of these same effects might be distressing and incapacitating for the individual who is taking a sulfonamide, and who is trying at the same time to carry on his usual program of activities.

GENERALIZED HYPERSENSITIVE MANIFESTATIONS

These usually occur after six or more days of therapy unless the patient has been sensitized previously by a course of sulfonamide treatment. Drug fever is one of the frequently encountered hypersensitive manifestations, and the differential diagnosis between a drug fever and a fever due to exacerbation of the infectious process being treated may at times be difficult. Keefer and co-workers[37] have offered these points which might aid the physician in diagnosing febrile reactions to sulfa: (1) The onset is usually abrupt and unexplained; (2) The fever is high and intermittent; (3) It usually occurs after one or more days of afebrility when the disease is in a quiescent state; (4) The patient may not appear as ill as the height of the fever suggests him to be; (5) The febrile episode is usually not accompanied by symptoms of the original illness, but by other signs of a hypersensitive state; (6) Onset is most commonly about the seventh day of sulfonamide therapy but may occur as early as the fourth day; (7) Accompanying chills are usually present; (8) There is usually a relative bradycardia; (9) There is rapid defervescence upon discontinuance of the drug. The leukocyte count may be high, low or normal and is of little value as a diagnostic sign.

There is considerable disagreement as to whether second or multiple courses of sulfonamides result in a higher percentage of febrile reactions than does the original program of therapy. Lyons and Balberor[50] postulated that an appreciable number of individuals must be made sensitive by one course of sulfa and would show febrile reactions to subsequent administration of the drug. They found that 36 per cent of 56 patients given a second course of sulfathiazole had a toxic febrile reaction. Dowling[14] and colleagues agree. They found that 69 per cent of 48 patients given a second course of the same drug reacted adversely, while 17 per cent of 30 given a different sulfonamide had untoward reactions. Kent and Diefendorf[38] obtained similar figures. However, Green,[30] Fink and Wilson,[21] Nickau,[56] and Nelson[55] noted no higher incidence of febrile reactions among patients receiving the sulfonamides for the second or more times. But it must be noted that at least some of the diversity of opinion lies in the interpretation of the figures. For instance, Kent and Diefendorf noted 9.7 per cent hypersensitive reactions to the first course and 21 per cent to the second, an increase of over twofold; whereas Nickau recorded an initial reaction rate of 22.5 per cent (and as high as 26.4 per cent reactions in subsequent courses), yet concluded that there was no increase in sensitization with multiple administrations. Everybody is agreed, however, that once an individual has become sensitized to a sulfonamide he will almost invariably react adversely to the readministration of that particular drug. This hypersensitivity has been demonstrated to last for as long as five years in certain individuals (Leftwich[45]), and there is no practical way of determining how long such a sensitivity might persist.

Arthralgia, angioneurotic edema, and asthmatic attacks have been caused by various members of the sulfonamide group.[62, 76, 85, 87] In themselves these conditions are not serious, but they are evidences of a hypersensitive state and the drug should be discontinued when they appear.

CARDIOVASCULAR AND RESPIRATORY LESIONS

Since French and Weller[24] first described interstitial myocarditis as a result of sulfonamide hypersensitivity, considerable interest has been focused on this phase of the subject. Virtually all the reports have been based on postmortem material, but it has been amply demonstrated that such a lesion does occur, and the possibility of its presence serves as a cardinal indication for discontinuance of drug therapy when signs of hypersensitivity become manifest. Fatal cases of sulfonamide myocarditis, which are not readily diagnosed clinically, have been reported (Wells and Sax[84]).

Thompson and Zeek,[78] and other observers, record a widespread necrotizing angiitis involving small arteries and some veins in the heart, spleen, kidneys and liver in necropsy material in cases of sulfonamide sensitivity. This was apparently an accentuation of the vascular component of the allergic process rather than a new lesion. And in reviewing the pathologic changes found in 30 deaths due to sulfonamides, Gessler[26] described an interstitial pneumonitis attributed to drug hypersensitivity. The clinical significance of this lesion is not apparent, but the occurrence of it is not surprising in view of the protean manifestations of the allergic state.

LESIONS OF THE HEMOPOIETIC SYSTEM

Changes in the blood picture were among the first noted toxic manifestations of the sulfonamide drugs, yet the exact mechanism by which these alterations are produced is still not clear. Cyanosis is almost a constant accompaniment of sulfanilamide treatment but is only rarely seen when other members of the drug group are used. Kracke[41] states that the cyanosis is not due to sulfhemoglobin or methemoglobin, and is probably due to some oxidation product which stains the red cells. Whatever the cause, he reports that it does the patient no harm, for the oxygen carrying capacity of the red cells is not reduced; and there is no indication for withdrawal of the drug.

There is bone marrow depression with arrest in development of the granular series and destruction of adult forms in patients who develop leukopenia while taking sulfonamides. Though the exact mechanism for this is unknown it is thought to be toxic because the same drug may be given later without recurrence of leukopenia. Long[49] and Nixon and co-workers[57] report several cases of sulfadiazine agranulocytosis which were successfuly treated with sulfadiazine. These observers felt that the patients would have died of their infections without chemotherapy, but that the bone marrow might regenerate despite the sulfadiazine. However, with the advent of the antibiotics there is no longer a need for such heroic measures. Since agranulocytosis alone is not fatal, and deaths among patients with this disease are caused by intercurrent infection, it is well to keep all patients with agranulocytosis on penicillin until the leukocytes regenerate. Hettig and Sturgis[33] have discussed avitaminosis B as a possible causative factor in the production of leukopenia in man, but no conclusions could be drawn.

Acute hemolytic anemia occurs early—as a rule between the third and fifth day of drug therapy. Dameshek[13] has found autohemagglutinins and cold hemagglutinins in patients with acute hemolytic anemia who were receiving sulfonamides for virus disease. However, it has subsequently been shown that cold agglutinins develop in many cases of virus pneumonia, so that it is not always apparent whether the drug or the virus accounts for the agglutinins, and whether the agglutinins cause the hemolysis. Two cases splendidly reported in great detail illustrate the difficulty of making a positive and final decision in this matter. One was that of a child, reported by Ross and Paegel,[68] who developed acute hemolytic anemia after taking 0.75 gm. of sulfadiazine. He had had sulfathiazole three years previously and sulfadiazine two years previously. There was hemoglobinemia and hemoglobinuria, and spectroscopically there were absorption bands for methemoglobin, oxyhemoglobin, and methemalbumin. There were no cold autoagglutinins or hemolysins. However, 46.8 per cent of the erythrocytes were spherocytes and showed an increased fragility to saline. These observers were convinced that the child became sensitized to sulfadiazine so that readministration of the drug resulted in alteration of the erythrocytes and rapid hemolysis.

However, in an equally detailed presentation Foy, Gluckman, and Kondi drew different conclusions.[22] Their case was that of a 24-year-old soldier who developed acute hemolytic anemia after 15 gm. of benzyl sulfanilamide given in a period of three days for cellulitis. The plasma of their patient gave positive absorption bands for oxyhemoglobin, methemoglobin, methemalbumin, and hemobilirubin, but not for sulfhemoglobin. There was also intracorpuscular methemoglobin. Here, though, the erythrocytes showed increased resistance to both saline and lysolecithin solutions. There was no abnormality of the Price-Jones curves, of mean cell diameter, volume, or thickness. The erythrocyte volume-thickness index, diameter-thickness ratio, and surface areas were all normal. The observers postulated that here the hemolysis was due to circulating hemolysins, although appropriate tests to prove this point were apparently not done.

Dameshek[13] makes the practical suggestion that patients with acute hemolytic anemia be transfused very carefully if they must be transfused at all, since the incidence of transfusion reaction is high in this type of patient. Crossmatching should be done in Landsteiner-Levine tubes at both room and incubator temperatures. Warm (not banked) blood should be used, and urine of the patient should have been previously alkalinized.

Thrombopenia due to sulfonamides does occur but is fortunately rare. (Kracke[41] was able to collect 15 cases from the literature to 1943.) This complication may be a direct toxic effect, since Kracke and Townsend[42] found that there was a decrease in platelets on the first day of sulfathiazole therapy and a decided increase on the first day after discontinuance of treatment. Thrombopenia may occur either early or late in the course of treatment and is usually irreversible and fatal. Farfel[20] records one case of thrombocytopenic purpura following sulfathiazole which was cured by splenectomy. A leukemoid reaction may occur as a result of sulfonamide therapy, and is the expected leukocyte picture accompanying hemolytic anemia. This raises the question of the possibility of an etiological relationship between sulfonamide reactions and leukemia. Kracke[41] reports the case of an individual who received two weeks' treatment with sulfathiazole for an infection of the orbit. At this time the patient's leukocyte count was normal, but four weeks later he had myeloblastic leukemia. Epstein and Custer[19] treated a child who developed leukopenia during her first course of sulfonamide in 1943. The drug was subsequently repeated with recurrence of leukopenia, and she died in 1944 with aleukemic leukemia. No conclusions can be drawn but the close association of the two circumstances is suggestive of some etiological connection.

GENITO-URINARY LESIONS

Probably more attention has been directed to the renal manifestations of sulfonamide toxicity than to any other phase of the problem, for the renal complications are serious and frequently fatal. It is therefore advisable to consider here the types of renal damage which may be caused by the sulfonamides, and the precautions which should be taken to minimize or circumvent these complications. Space does not permit any consideration of current trends in the treatment of such damage.

Immediate, direct renal damage as evidenced by hematuria and albuminuria results most frequently when the intravenous route of administration is used, but may occur when the drugs are given by mouth. These signs give positive evidence of renal irritation and should lead to immediate discontinuance of sulfonamide therapy. The tubular damage found at necropsy in individuals dying from sulfonamide reactions was first ascribed to direct toxic action of the drugs on renal epithelium, but recent studies indicate that the damage is most often the result of a hypersensitive state. Black-Schaffer,[8] Simon,[72] French,[23] More, McMillian and Duff,[54] and Schattenburg and Harris[70] have all given fine accounts of the histopathology of the hypersensitive renal lesion. French's report might be quoted as being a representative description: "Renal lesions of many kinds were encountered in approximately one-half of the cases reviewed. Those believed to have been caused by the action of sulfonamides included interstitial nephritis, in which characteristic acidophilic mononuclear and polymorphonuclear cells were conspicuous components; crystal formation, often associated with calcium deposition, or with accumulations of bluish staining material both intratubularly and extratubularly; and vascular fibrinoid necrosis, thrombosis, subpelvic hemorrhages, and vascular fibrinoid necrosis, thrombosis, subpelvic hemorrhages, and cellular infiltrates. Both focal necrosis and cellular infiltrates were seen in sections showing interstitial nephritis.

"Tubular lesions were for the most part limited to the distal portions of the nephron, including the ascending limb of Henle's loop and the distal convoluted and collecting tubules, in which necrosis of the tubular epithelium and regeneration of the lining cells were seen. The lumina were plugged and the tubules distended with hemoglobin casts, crystals, crystals combined with calcium salts, erythrocytes, leukocytes, and amorphous protein precipitates. Some tubules showed necrosis of the lining with rupture of the walls and escape of crystals into the adjacent interstitial tissues. Glomerular and proximal tubular lesions were less frequent but glomerular vascular lesions were striking when present."

The condition which first drew attention to the damaging effects of the sulfonamides on the kidneys was anuria due to precipitation of crystals in the collecting system, either intratubularly or in the pelvis and ureter. This is simply a matter of solubility of drug in urine, and precipitation may occur under clinical conditions with any member of the drug series except sulfanilamide and sulamyd. These two are so soluble that precipitation will not result at any dosage within the therapeutic range. It must be remembered, though, that both sulfanilamide and sulamyd will give rise to the allergic type of renal lesion.

What, then, may be done to reduce the incidence of serious renal damage? There are a number of precautions which should be carefully followed when any patient is given a sulfonamide:

1. A careful past history for sulfonamide administration and reaction should be taken. If an individual has had a previous reaction of any type, great caution should be exercised for he is probably still sensitive.

2. The safest effective drug should be chosen for any given condition which is to be treated. Sulamyd

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is as efficient as any of the other members of the group for urinary tract infections and eliminates the danger of precipitation of crystals. It is not satisfactory for systemic infections, however, because elimination by the kidneys is so rapid that maintenance of therapeutic blood levels is difficult. For infections which must be combatted by adequate sulfonamide blood levels, a combination of two drugs, either sulfadiazine and sulfathiazole or sulfadiazine and sulfamerazine may be used. (Lehr[46] has demonstrated that the solubilities of the two components are independent of each other, while the therapeutic efficiency is cumulative. Thus sulfonamide precipitation is only half as likely to occur as if the same total dosage of only one member of the group were used.) Thorn[79] feels that sulfadiazine-sulfamerazine is the most logical combination since the two drugs differ chemically by only one methyl group, and when an individual becomes sensitive to one he is almost invariably sensitive to the other. Thus when the patient becomes hypersensitive to this combination a switch may be made to sulfathiazole with a fair chance that it will be tolerated. Had sulfathiazole been contained in the original mixture, then the patient would have been rendered sensitive to all three drugs and there would be no alternative but to discontinue sulfonamide therapy completely.

3. Fluids should be forced to cause a urinary output of between 1,500 and 2,000 cc. per day.

4. The urine should be made alkaline. A fairly large quantity of base is necessary; the only certain check of urine alkalinity is daily testing, preferably with nitrazine paper. As a rule about 20 gm. of sodium bicarbonate per day is necessary to alkalinize the urine when the patient is receiving sulfadiazine. If the alkali must be given parenterally, Gilligan and Dingwell[27] recommend 500 to 1,500 cc. of 1/6 molar sodium lactate as an initial dose either intravenously or subcutaneously, and then 1,000 cc. of the same solution daily in two portions. When the picture is complicated by the necessity of withholding sodium because of the cardiac status, then the urine may be rendered alkaline by giving 8.0 gm. of $KHCO_3$ initially and 2.0 gm. every four hours. Only rarely will the urine remain acid in the presence of this amount of bicarbonate, but if it does the dosage may be increased by 25 per cent (Ohnysty and Wolfson[58]).

5. The patient's clinical course should be followed carefully and signs of renal damage looked for: (a) Ureteral colic or pain in the flanks should arouse immediate suspicion of "urolithiasis medicamentosa." (b) A warm freshly voided urine specimen should be checked frequently (every 48 hours at least). Microscopic hematuria or appreciable albuminuria is indication for alteration of therapy. As Janeway[34] emphasized, sulfonamide crystals in cold urine may be of no significance, but crystals in freshly voided urine mean that precipitation is taking place within the urinary tract. If this is occurring the dosage is too large, the urine output is too low, or both of these conditions obtain. (c) Any unexplained rise in the blood urea nitrogen level of patients receiving sulfonamides should be regarded as a sign of a toxic reaction, and the drug must be discontinued immediately. Vilter and Blankenhorn[81] have pointed out that a rise in the blood urea nitrogen is the first sign of sulfonamide nephrosis. This occurs even before there is oliguria, and is true irrespective of the sulfonamide being used, or the pH of the urine.

Finally it should be noted that patients with decreased renal function build up high blood levels of sulfonamides very rapidly; and in such circumstances sulamyd is the drug of choice when chemotherapy must be used. For instance, a patient who has prostatism with nitrogen retention and whose urine is being drained by catheter will accumulate a high blood titre of sulfonamide on "prophylactic" (2.0 gm. per day) dosage of sulamyd.

It has been suggested that sulfonamides might have a deleterious effect on the germinal epithelium of the testes. Osenkop and MacLeod[59] conducted a careful study of this phase of the problem, and concluded that sulfadiazine in therapeutic dosage over a period of two to nine weeks had no appreciable effect on the quality of semen specimens obtained.

SKIN AND TOPICAL

While some sulfonamide rashes appear to be toxic in nature and disappear despite continued administration of the drug, and some are associated with photosensitivity, the majority are manifestations of a hypersensitive state. As has been pointed out, appropriate skin tests are frequently positive. An impressive variety of skin lesions has been attributed to the sulfonamides (Peterkin[60] lists 16 different types), and while some of them are serious in themselves they are more important as signs of generalized hypersensitivity which may next manifest itself as fatal anuria or myocarditis. Also the sulfonamide reaction may appear as an exacerbation of the dermatological condition being treated rather than as a venenata (Schaffer and co-workers[69] and Benedek[7]). It is the consensus of opinion among dermatologists that sulfonamides are used too frequently and too extensively in the treatment of trivial skin conditions, and Bechet[5] has made the following suggestions for local application of sulfonamides: (1) local use of sulfonamides should be avoided in trifling cutaneous lesions. Use of them should be reserved for serious coccal skin infections. (2) The period of administration should be limited to six days or less. (3) Solar and quartz light exposure should be avoided during the course of treatment. (4) Patch testing should be employed cautiously as it may cause a severe flare-up of the original condition.

While the placing of large quantities of sulfonamides into open wounds (burns, lacerations, and the peritoneal cavity) has been generally abandoned, the practice is still occasionally resorted to. Therefore, one should remember that the absorption is rapid, that the blood level of the drug rises quickly, and that the entire series of toxic effects is as likely to occur under these conditions as when the drug has been introduced orally.

NEUROPSYCHIATRIC EFFECTS

Neurological disturbances attributable to sulfonamides are varied and, in some instances, serious. Little[48] was able to compile the following list of reported effects: dysmorphopsia, aphasia, agraphia, stammering, toxic psychosis, peripheral neuritis, encephalomyelitis, myelitis, optic neuritis, transitory myopia, signs of meningeal implication, blindness and convulsions.

The course of acute sulfonamide poisoning in human beings is illustrated by Reed's case report[63] of a three-year-old child who ate 6 gm. of sulfanilamide. Coma and spasticity with convulsive movements resulted, but the infant began to improve after 14 hours, and recovery was complete.

Peripheral neuritis is usually a result of long continued systemic administration of the drug and is usually of mild degree with complete recovery to be expected. However, Elkington[18] reports several case of permanent paralysis (sciatic and radial nerves) as a result of the intramuscular injection of sodium sulfapyridine. There seems to be no necessity for giving the sulfonamides intramuscularly, and certainly this method of administration should be abandoned completely. Likewise, the intrathecal use of certain of the sulfonamides is disastrous. A review of the German literature[16] disclosed seven cases of paraplegia resulting from intrathecal injection of sulfapyridine.

Pilcher and co-workers[61] have found that sulfathiazole acts as a convulsant when applied to the brains of human beings and experimental animals; this is apparently not true for other drugs of the group. These observations indicate that sulfathiazole should never be applied locally in surgical or traumatic head wounds in such a manner that the drug might come in contact with brain tissue.

Psychoses resulting from the sulfonamides include symptoms of delirium, delusions (both visual and auditory), fear of impending death, sensorial defects, confusion and excitement.[39, 77] Depression does not seem to be a prominent feature of these psychoses, but precautions against suicide should certainly be taken.

EYE, EAR, NOSE AND THROAT

Many changes in ocular function have been attributed to the toxic effects of sulfonamides, but few of them are of great importance. One of the early signs of sulfonamide hypersensitivity is conjunctivitis, and it should be respected as a warning of other more serious possibilities. Alvaro[2] has reviewed the literature extensively with regard to the ophthalmic aspect of sulfonamide toxicity and has collected the following array of changes: Palpebral edema, conjunctivitis, chemosis, scleral reaction, cells in the aqueous chamber, iritis, mydriasis, cataract, changes in angioscotomas, edema of retina, reduction of visual fields, retinal hemorrhages, optic neuritis, unexplained blurred vision, transient hyperopia, astigmatism and myopia, and changes in accommodation. Rosenack and Maschmeyer[67] had the rare opportunity of sectioning the eyes of an individual who developed fatal periarteritis nodosa on sulfadiazine, and found at necropsy that there were minimal vascular lesions in the choroid vessels. Reynolds[64] has noted that even small doses of sulfonamides may significantly alter fine visual adjustments. Muscle balance for near vision and depth perception showed the largest deviation from normal, and sulfadiazine caused more disturbance than sulfathiazole. They concluded that the sulfonamides should not be administered to ambulatory patients, such as aviators, who need maximum visual acuity. Another potential danger which has been noted by Cullen[12] is the incompatibility of sulfathiazole with silver nitrate. Silver nitrate should not be instilled into the eyes of persons receiving sulfathiazole if there is any possibility of a break in Bowman's membrane. In these circumstances the locally applied $AgNO_3$ combines with the systemically administered sulfathiazole and an insoluble precipitate forms beneath Bowman's membrane in the eye which must then be removed surgically.

Reports of harmful effects from sulfonamides on the mouth, nose and throat are quite rare. However, Schnee[71] has recorded a membranous process suggestive of diphtheria which developed in a soldier during a course of sulfathiazole therapy for an upper respiratory infection. This grayish membrane was accompanied by no unpleasant odor; it stripped off readily but reformed rapidly, and disappeared quickly upon discontinuance of drug therapy. Smears and cultures for Klebs-Loeffler bacilli were negative. This process involved the palate, fauces, floor of the mouth, gums, inside of the cheeks, posterior pharynx, larynx, and nasal mucosa. The conjunctiva were similarly involved.

No report of toxic involvement of the hearing apparatus could be found in the literature other than external otitis which is at times a part of generalized exanthem, and one case of eighth nerve deafness collected by Little.[48]

GASTRO-INTESTINAL EFFECTS

The problem of early nausea and vomiting has already been dealt with and will not be reconsidered at this point other than by mention of the work of Einsel,[17] who measured the sulfonamide content of gastric juice after intravenous administration of the drug. Sulfapyridine determinations disclosed a higher level in the gastric juice than in the blood; and it was also demonstrated that the quantity of sulfapyridine in the gastric secretion remained high for a longer time than did sulfanilamide under similar conditions. This was thought possibly to account for the high incidence of gastric irritation which attends administration of sulfapyridine. Two cases of gastro-intestinal hemorrhage, apparently due to sulfonamides, have been reported by Crawley.[11] One was that of an adult and one that of a child; both were given sulfapyridine for meningitis. Melena developed on the seventh and eighth days of therapy, respectively, there having been no past history of gastro-intestinal bleeding. In each case there was an elevation of the leukocyte count, but no purpura. Apparently complete blood studies to rule out a bleeding tendency were not performed.

HEPATIC DAMAGE

That severe hepatic necrosis does occur as a result of sulfonamide administration is beyond question. This pathologic change has been reported by Menteen and Andersch,[53] Geever,[25] and others.[29, 32] Williams[86] is of the opinion that hepatosplenomegaly occurs frequently enough in individuals who react adversely to sulfonamides to serve as a valuable sign indicative of toxic reaction. Andersch[3] studied liver function by means of Gray's colloidal gold test and found that 13 per cent of 106 patients gave evidence of altered liver function. This is in accord with the observation of Cantrow and Wirts[9] that patients on sulfonamides sometimes have hyperbilirubinemia. These authors present 20 cases with evidence of hepatocellular damage.

MISCELLANEOUS CONSIDERATIONS

Placental Permeability to Sulfonamides: Both clinically and experimentally it has been demonstrated that there is transmission of sulfonamides across the placental barrier from mother to fetus.[44] Ginzler and Chesner[28] report the case of an infant who died on the eighth postnatal day with necrosis of liver, adrenals, and spleen and mild tubular degeneration of the kidneys. The mother was receiving sulfanilamide at the time she went into labor, but none of the drug was given to the infant. The blood level of sulfanilamide in the newborn child, five days after delivery, was 1.5 mg. per 100 cc. So it seems advisable to administer these drugs cautiously to pregnant women.

Effect of Sulfonamides on the Thyroid: In rats the administration of the sulfonamides leads to a sharp drop in the basal metabolic rate and simultaneous hyperplasia of the thyroid; cells resembling those noted following thyroidectomy also appear in the anterior lobe of the pituitary. These observations apparently have no clinical application since therapeutic dosage in human beings has not led to reported cases of metabolic disturbances.[52]

Problems Associated with Anesthesia: Because the sulfonamides apparently reinforce the hypnotic effect of the barbiturates in animals, Adriani and St. Romain[1] were led to investigate the possible effect of chemotherapy with sulfonamides on the course of surgical anesthesia. In 66 patients who were on a therapeutic regimen of sulfa drugs at the time of operation, no perceptible alteration in the response to anesthetic agents, either volatile gases or sodium pentothal, could be detected.

Notes on Specific Drugs: The most recent statistics based on several thousand collected cases indicate that 6.5 per cent of patients treated have important toxic reactions to sulfadiazine[49] and, according to Dowling,[15] reactions to sulfamerazine are of similar frequency.

As sulfasuxidine and sulfathalidine are only sparingly absorbed from the gastro-intestinal tract, there is little danger of crystalluria and chemical uroliths; but all the hypersensitive reactions may occur with these drugs, and deaths have been reported from their use.[10, 35, 75]

No published report of a serious reaction to sulamyd was found in this survey of the literature, but such reactions certainly occur. The author knows of one individual who died of congestive heart failure and sulfonamide hypersensitivity 13 days after prostatectomy. The patient had received sulamyd for six days beginning on the day prior to operation and ending on the fifth postoperative day when fever, rising blood non-protein nitrogen level, and serious congestive failure supervened. At no time was there oliguria, yet at necropsy widespread lesions of hypersensitivity type, of sulfonamide origin, were found. Most noteworthy of these were interstitial nephritis and myocarditis which had precipitated heart failure in an organ previously damaged by arteriosclerosis.

Notes on Newer Preparations: The pharmaceutical companies are now marketing tablets containing combinations of sulfonamides: one-half sulfadiazine and one-half sulfathiazole, or one-half sulfadiazine and one-half sulfamerazine. Also available is a liquid preparation containing the combination of drugs plus alkali. The manufacture of these products was stimulated by the solubility studies of Lehr previously discussed, and there is no doubt that the employment of mixtures of sulfonamides deserves universal acceptance. However, the convenience of prescription for both doctor and patient which is obtained by having the drug mixture prepared by the manufacturer is an advantage which must be weighed against the greater expense of the product.

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CLINICAL SYMPOSIUM

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Ulcerative Colitis

Medical Management

HAROLD M. HAND, M.D.*

ULCERATIVE colitis varies greatly in severity. It may be mild, with involvement of only the rectum and rectosigmoid, so that general treatment alone may be sufficient to bring about recovery or at least remission. Or it may be severe and fulminating, with septic fever, severe anorexia, dehydration, and great blood loss due to almost constant bloody diarrhea. In this stage, management of allergic reactions is not practicable, the psychiatrist may do more harm than good, and ileostomy may cause death.

Treatment in general is best divided into two parts, that which consists of palliative and supportive measures, and that designed to affect more directly the inflammatory reaction in the bowel.

Under supportive treatment, which I think is the most important part of therapy in the average case, we might consider, first, control of malnutrition. It is important to make the diet as liberal as possible in order to get adequate calories for the patient. For years, a high protein diet has been stressed. The patients often have hypoproteinemia and usually have nitrogen deficiency. In many cases it may be necessary to supplement the diet by protein hydrolysates orally and intravenously.

Supplemental vitamins are essential because of poor absorption, loss in diarrheal content, and inadequate intake. Vitamins should be given in large doses by mouth and, if there is marked evidence of avitaminosis, parenterally also. In addition to the ordinary synthetic vitamins, brewer's yeast should be given by mouth as a source of natural vitamin B complex. If vitamins are given parenterally, in addition to vitamin C and vitamin B complex, liver extract is also beneficial.

Correction of the depletion of blood and blood proteins is important. As there is usually anemia due to loss of blood as well as hypoproteinemia, transfusions of blood and plasma should be used freely.

Another palliative measure of importance is control of diarrhea. The diet should be smooth and low in residue to avoid stimulating intestinal motility. Inert substances such as bismuth and kaolin which have a tendency to retard motility and solidify stools may be given. Tannalbin also is frequently used for this purpose. Tincture of opium is occasionally beneficial if used for only a short period of time in an acute flare-up. (It should not be used for long periods, however, because of the tendency to habituation.) Bed rest, sedatives and antispasmodics are helpful in controlling diarrhea, and removal of foci of infection also may help.

Psychotherapy is of definite value as a palliative measure. Although it is desirable to have a formal psychiatric evaluation, this is not always feasible. In any event, general psychotherapy will fall largely on the shoulders of the attending physician, who should, of course, administer psychotherapy to the limit of his ability. Very often he can accomplish much by patient listening, sympathetic understanding, reassurance, helping the patient adjust to this serious chronic disease, helping him with emotional and family problems. (Problems associated with a dominating parent are found commonly in patients having this disease.)

Palliative treatment alone may induce a remission in some of the mild cases. In considering the measures which are supposed to attack more directly the inflammatory reaction in the colon, one may mention, first, vaccines and serums.

For many years Bargen has claimed that a diplostreptococcus is the specific causative agent in most cases of ulcerative colitis. Bargen's work has not received general confirmation. It is felt by most workers that the streptococcus described by Bargen is a variant of the streptococcus fecalis, and there is no real evidence that it is other than a secondary invader. For that reason the use of diplostreptococcus antiserum and vaccine is confined largely to Bargen and his associates.

Serums such as polyvalent anti-bacillary dysentery serum, which was first advocated by Hurst in England and used in this country by Crohn and by Bockus, are not used much now. I have seen a few patients, in whom the disease was acute, respond rather strikingly to this serum. It was the opinion of Bockus, and I think also of Crohn, that the benefit was not due to a specific effect but rather the result of a foreign protein reaction. It is noteworthy that the patients who do have a definite or striking response are usually the patients who develop rather severe serum sickness. Serums and vaccines are very little used since the advent of chemotherapy and antibiotics.

Block and Pollard summarized their experience and the experience of others regarding sulfonamides and antibiotics in the treatment of ulcerative colitis about as follows: The sulfonamides, although definitely helpful as a therapeutic adjunct in the treatment of ulcerative colitis, are definitely not curative

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in this disease. The response is variable and unpredictable; it may be rather striking at times, and at others there is no apparent benefit. Benefit from sulfonamides is probably due to their effect on secondary infection and on the bacterial flora of the fecal material. The investigators believe the most effective sulfonamide is sulfathalidine, with sulfasuxidine a close second. The locally acting sulfonamides may be given over a long period of time in small doses in order to maintain remission; this cannot be done so well with the more completely absorbed sulfonamides. However, in patients with infection and fever, and perhaps complications of ulcerative colitis, the sulfonamides, such as sulfadiazine, which act after system absorption, may be more valuable than the locally acting drugs.

Penicillin given parenterally has been found to be of very little if any value in inducing remission in the average case of ulcerative colitis. It may be very valuable, however, as adjunct therapy in some of the acute febrile complications such as pericolic abscesses. The effectiveness of penicillin given orally, as advocated by Streicher, requires further evaluation. Essentially the same thing can be said of streptomycin. It has not yet been clearly evaluated but seems to have little or no value in inducing remission. The principal effect of streptomycin is probably on the intestinal flora, an effect which can be achieved more easily and certainly more economically by use of sulfonamides. The rapid development of resistance by the coliform organisms to streptomycin would seem to make it of doubtful value in the average case of ulcerative colitis. However, it too has been found rather helpful at times in conjunction with other measures to combat acute complications with fever in this disease.

Among other measures supposed to affect directly the inflammation of the bowel is antiamebic therapy. This is of course of no value unless amebic infection is present. In an occasional case, when the appearance of the bowel, as viewed by sigmoidoscopy, is not typical of non-specific ulcerative colitis and no amebae are found in the stools, antiamebic therapy may be worth a trial. More important in those cases in which lesions atypical of ulcerative colitis are disclosed by sigmoidoscopy, is to institute additional and more careful search for amebae. We have been gratified to find these organisms by additional examinations in several such cases. Allergy, which Dr. Rowe will discuss, is certainly a factor in many cases of ulcerative colitis, particularly in causing progression and in maintaining activity. However, I do not believe allergy is the basic or fundamental cause of the disease. The bland qualities of the diet given in determining allergic factors may be significant in the improvement noted, at least in some of the milder cases. In severe fulminating cases with almost complete anorexia, it is difficult to supply adequate calories, and for that reason such diets are contraindicated in those circumstances. In less severe cases, the patient himself will rebel at such a diet for a prolonged period. After ileostomy most patients make a striking improvement even though the colon (which the allergist considers the shock organ in ulcerative colitis) is still in the body and the patient is taking an unrestricted diet.

Miscellaneous procedures of all kinds have been used. Martin has tried using thiouracil without any truly rational basis, but with reported good results.

As to the prognosis of this disease, the best review in the literature is that of Kiefer. He reported 327 patients treated for a period of two years or over. The striking thing is the close correlation between the effectiveness of medical treatment and the amount of involvement in the bowel. Where only the rectosigmoid or this area and the left side of the bowel were involved, about two-thirds of the patients got along satisfactorily on medical treatment. On the other hand, if the entire bowel was involved, or if segmental colitis was present involving the right side of the bowel, the disease was controlled by medical management in only about one-third of the patients. Of the total patients in his series, about one-half responded satisfactorily to medical management. For patients who do not respond well to medical treatment, the choice lies between a great deal of disability and operation, which usually means ileostomy with or without colectomy.

I believe there is no great difference of opinion as to the necessity for operation in quite a large number of these patients. However, there is considerable difference of opinion as to when medical measures should be abandoned for surgical procedure and as to whether or not operation should ever be done in the patient with ulcerative colitis of the acute fulminating type. Cattell's review of the fatalities in patients undergoing operation for ulcerative colitis showed that two-thirds of the mortality came in operations done as emergency measures on these patients. The Lahey Clinic group succeeded in cutting down this mortality by getting the patient and the doctor to accept ileostomy earlier. Certainly this will decrease the mortality rate in the acute febrile cases, but it may also increase the number of patients with a permanent ileostomy who might otherwise have had a remission without it. Bargen recently stated that he and his associates at the Mayo Clinic have not had an ileostomy done for acute fulminating ulcerative colitis in the last ten years, because of the high mortality. Bockus has also abandoned use of ileostomy in the acute fulminating cases because of the associated high mortality.

Allergic Aspects

ALBERT H. ROWE, M.D.*

When an allergic state is the sole cause of ulcerative colitis, pathological changes in the colon with resultant symptoms gradually disappear with the control of food, pollen or drug allergies. But when the allergic reactivity is complicated by infection, anemia, hypoproteinemia or avitaminosis, the various complications of severe or fulminating cases arise.

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Following are the reasons for considering allergic reactions to food as a primary cause of the disease:

1. Allergic reaction to foods in the gastrointestinal tract is very common. It may be localized to any area from the mouth to the anus. Allergic states in the mouth and pharynx (especially those causing canker sores), in the stomach and probably in the small intestine, have occurred not infrequently in our controlled cases of chronic ulcerative colitis. Evidence also increases that "mucous colitis," the irritable colon, colonic pain and soreness, idiopathic bleeding especially in childhood, constipation and diarrhea, as well as localized inflammations in the lower bowel, rectum and anal canal, and pruritus ani, require the proper study of allergic reactions, especially to foods, along with other recognized causes. Milk and, less frequently, fruits, egg, chocolate and other foods may cause allergic diarrhea. With recognition of such allergic states, the necessity of assuming psychosomatic causes for gastrointestinal disease, and especially symptoms, will be greatly reduced.

2. Allergic reaction offers the most logical explanation for the underlying lesions of chronic ulcerative colitis. Remembering that atopic allergic states may cause vascular reactions, the hyperemia, edema and easy bleeding of the mucosa can be understood. The granular appearance can be explained, as in atopic eczema, by the minute amounts of serum that exude from the allergically inflamed tissues, giving the mucosa a granular appearance. Protein-rich serum finally exudes, often in large amounts, causing in part the hypoproteinemia.

The herpetic and larger ulcers in the colon of many patients with ulcerative colitis may arise from minute vascular thromboses similar to those which cause oral canker sores, which as we know are usually caused by allergic reactions to food and at times to drugs or bacteria. When secondary infections occur, these ulcers extend, encouraging further infection. This infection, and especially autodigestion by trypsin rushed into the colon by hyperperistalsis, causes denudation of the mucosa and exposure of larger vessels, with consequent free or massive bleeding and at times perforation.

3. As has been shown experimentally and clinically, chronic allergic reaction can produce scar tissue. This, with or without secondary infection, can result in fibrosis, with resultant narrowing, loss of haustra, and kinks and strictures in the colon. When infection is active, fistulae, adhesions, localized or generalized peritonitis, and at times death, may result.

4. Exacerbations in chronic ulcerative colitis can be explained by the tendency for chronic allergic states to become refractory, which accounts for the recurrent attacks of bronchial asthma, allergic headaches or migraine and other manifestations, due especially to allergy to foods.

In the treatment of chronic ulcerative colitis, the possibility of allergic reaction as a cause has been considered in all our patients. For the study of possible allergic response to foods, the fruit and cereal-free elimination diet is preferred in mild or moderate cases of this disease. If the patient knows that a food in the diet disagrees, it is excluded. At first, specified vegetables may be pureed if diarrhea is marked. Potato or tapioca caramel puddings, potato-soy bakery products, and sugar with specified meats must be taken in amounts to protect weight and nutrition. In fulminating cases a "minimal diet" containing white potato, tapioca and at times rice, sugar, lamb, tea and salt may be helpful. It should contain 2,500 or more calories and at least 75 grams of protein. In those cases in which the patient is benefited, improvement occurs in about 10 to 20 days. After this is assured, then single foods such as rice, rye and corn can be added, one every five to seven days. Fruits should be tried cautiously; and milk, because of the great frequency of allergic reaction to milk in these cases, should be excluded for many months. If definite evidence of allergic response to milk or other foods is obtained, it may be wise to exclude them for years.

If allergic reaction to pollen is indicated by the patient's history, with or without positive skin tests, desensitization is important, and the use of a pollen filter in the bedroom may be advisable. In one patient with chronic ulcerative colitis that had recurred for seven years in the late summer and fall, the disease now has been well controlled with pollen antigen therapy alone for seven years. When allergic reaction to pollen is suspected, multiple antigens should be used. Extremely weak dilutions are advisable during the pollen season. Prolonged perennial desensitization is important.

For hypoproteinemia, transfusions and at times plasma are important. Amino acids by vein may be given, but the tendency to venous thromboses and reactions from them should be borne in mind. Because of the residual traces of milk or pork allergens in the trypsin digested product, the acid hydrolyzed amino acids are preferable for patients with chronic ulcerative colitis. These amino acids may be given also by mouth if the taste is tolerated.

Antihistaminic drugs have reduced cramping and tenesmus in three patients. Mild symptoms in one patient were controlled with pyribenzamine three times a day even with gradual reinstatement of a general diet.

Surgical Aspects

LEON GOLDMAN, M.D.*

We are all in agreement that the treatment of chronic ulcerative colitis is medical as long as the patient is doing well and as long as satisfactory results are obtained.

The surgeon has this to say: Many patients with ulcerative colitis die of the disease. A mistake that surgeons have made in this clinic has been in operating on patients too late. Among those patients who come to surgical operation moribund or close to being moribund, the mortality rate is very high. Some of these patients present surgical problems. The internist should call in the surgeon when certain problems arise, even though the patient does not require an operation. In border-line groups there may be great difficulty in arriving at a decision.

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Everett Kiefer of the Lahey Clinic reported a series of late clinical results in patients with ulcerative colitis who were under medical management. In patients they treated over a period of two years, he reported good control or good results in 34 per cent; fair control in 12 per cent; and poor control in about 54 per cent. It takes a long period of time before one can draw up a lifetime prognosis of an individual patient. Histories may differ tremendously among cases. In spite of the sigmoidoscopic examination the clinical aspects may vary. Many patients have had acute or chronic ulcerative colitis and have had complete disappearance of symptoms or a long phase of remission followed by recurrence. Often the disease progresses and the patient's condition becomes worse in spite of anything that is done; and in many patients who have acute fulminating ulcerative colitis the problem is grave with or without any surgical treatment. Unless we can ear-mark each case, it is difficult to arrive at a prognosis and difficult to evaluate therapy.

There are certain indications for surgical operation: Disability from the disease in spite of any therapy; sepsis of one type or another; persistent inflammation in the colon; intra-abdominal abscesses; and inflammatory tumors of the bowel or mesentery. There is another group in which carcinoma develops—3 per cent of all patients with ulcerative colitis and 7 per cent of those operated on.

In the group reported by Kiefer, 36 per cent required surgical treatment. Cattell from the same clinic reported that in a 20-year period surgical operation was necessary for about 25 per cent of patients with ulcerative colitis. These percentage figures may be relatively high, since many of the patients were sent to the Lahey Clinic specifically for that purpose.

Ileostomy is the required procedure, and surgical deaths are experienced mainly in the first operation. Whereas the over-all mortality rate was about 20 per cent in the Lahey Clinic series, in the last two years it has been only 4 per cent—mainly because patients have been operated on earlier in the course of the disease and operation has not been carried out on patients with acute fulminating colitis.

Pseudopolyposis and fistulae as well as organic stricture in the bowel (which it is important to differentiate from spasm) are indications for surgical operation.

Many patients will have a single or recurrent severe hemorrhage from the bowel which may even cause death. During the active hemorrhage phase it is generally felt that operation is not indicated because it is impossible to determine the source of bleeding. There are, however, reports in the literature of removal of parts of the colon, during hemorrhage, with survival of the patient.

In the segmental type of ulcerative colitis as described by Crohn, involving the right or left colon, one may be able to remove the involved part and anastomose the two ends, thus preserving the continuity of the intestinal tract. Usually the rectum is involved early in the disease, which necessitates ileostomy. With the use of a new type of ileostomy bag, many of the patients have less difficulty subsequently. The Rutzen bag, custom-made for the patient, fits snugly around the ileostomy opening. It is changed twice a day and it can be drained through a spigot at the bottom.

As ileostomy is a life-saving procedure followed by return to health, we have not yet encountered a patient who would rather be as he was before the operation, despite the inconvenience. Some physicians feel that if the patient is doing well after ileostomy, it is not necessary to remove the colon later. However, many patients continue to have infection in the colon even after diversion of the fecal stream by ileostomy. They may have sepsis involving the mesentery of the colon with absorption into the portal system carried to the liver. If the colon is not removed, some patients will have stricture or malignant growth after ileostomy is performed. For these reasons it is well to remove the colon six months after ileostomy. Since there is little possibility that the ileostomy may be closed at some later time and the continuity of the bowel restored, there is little reason to preserve the colon with that in view; the patients operated upon usually have irreparable changes that have been caused by the disease.

In recent years there has been a good deal of speculation regarding emotional factors as a possible cause of ulcerative colitis, but the reports in the literature are not very convincing. Many psychiatrists who write on the subject lump all the disurbances of the colon into one category. There is a great deal of difference between a patient who has a functional disturbance of the colon and one who has ulcerative colitis. Very few gastroenterologists have seen a functional disturbance, such as irritable colon, develop ultimately into ulcerative colitis.

California Cancer Commission Studies*

Chapter XIIA

Cysts and Tumors of the Jaws

Eugene W. Demaree, M.D., *Pasadena*

CYSTS and tumors of the jaws occur with much greater frequency than is generally recognized. The location makes early diagnosis and treatment imperative. Such lesions, if benign, are amenable to relatively simple treatment that will prevent deformity and injury to healthy teeth.

Late diagnosis or inadequate treatment of malignant lesions can result at best in mutilation, if not in death of the patient.

It is as much the responsibility of the physician as of the dentist to be on the lookout for the first signs of tumor growth. Occasionally metastatic foci from undiagnosed primary malignancies elsewhere in the body will make their first appearance in this easily accessible area. Histologic examination by biopsy may then lead to the discovery of the original lesion.

On account of difficulties in differential diagnosis and for the sake of simplicity, both benign and malignant lesions of the jaws will be considered, and the following simplified classification will be followed in this chapter:

CLASSIFICATION

A. Cysts of the Jaws:
   1. Cysts of non-odontogenic origin
      a. Median maxillary and mandibular cysts
      b. Globulo-maxillary cysts
      c. Incisive canal cysts
   2. Cysts of odontogenic origin
      a. Radicular cysts
      b. Follicular cysts
   3. Dermoid cysts

B. Odontogenic Tumors:
   1. Odontoma
   2. Cementoma
   3. Ameloblastoma (adamantinoma)
   4. Alveolar giant cell tumor

C. Osteogenic Tumors:
   1. Exostoses
   2. Osteoma
   3. Osteogenic sarcoma
   4. Central giant cell tumor
   5. Endothelial myeloma
   6. Multiple myeloma

D. Secondary Malignant Tumors:
   1. Metastatic carcinoma
   2. Lymphosarcoma

Diagnosis in every case is based on inspection, palpation, roentgenogram and biopsy. There is no excuse for omitting the biopsy examination because only in this way can an accurate diagnosis be made and adequate treatment be instituted.

CYSTS OF THE JAWS

True cysts of the maxilla and mandible are epithelial in origin and are lined by epithelium. They arise either from rests remaining during closure of facial clefts, or from cells concerned with tooth development.

NON-ODONTOGENIC CYSTS

With the exception of so-called "traumatic cysts," which are non-epithelial and merely osteolytic defects occurring as the result of hematoma formation, the non-odontogenic cysts are the result of developmental malformations and are consequently found only where embryonic processes fuse in the jaws. Such areas are found in the midline of the maxilla or mandible, the fusion between the premaxilla and maxilla, and in the incisive canals.

1. *Median Maxillary or Median Mandibular Cysts:*

These cysts may occur at any point along the junction of the maxillary processes, and are therefore found between the roots of the central incisors (anterior median cysts) or farther back in the soft palate (posterior median or palatine cysts). They arise from enclaved embryonal epithelium at the point of union between the two maxillary processes in the formation of the hard palate, or between the two halves of the mandibular process, resulting in the median mandibular cyst.

Unless they become infected or irritated by trauma, the lesions are symptomless, although the larger cysts may reach a diameter of 2 cm. in size, producing a swelling which may be seen either on the lingual or on the labial aspect of the gum.

In roentgenograms such cysts are revealed as elongated, elliptical, and frequently "drop-like" radiolucent areas between the central incisor teeth. They often cause divergence of the tooth roots but otherwise do not involve them. (See Figure 1.)

2. *Globulo-Maxillary Cysts:*

Globulo-maxillary cysts form in the alveolar bone at the junction of the globular and maxillary processes. They are lined with epithelial cells which were enclaved during fetal development and are found between the lateral incisor and cuspid teeth. Unless they become infected, discovery is usually accidental during routine radiographic examination which reveals a unicystic radiolucent area, frequently droplike, with the point extending up to the crest of the alveolar ridge. The adjacent tooth roots diverge but may be incorporated within the cyst. (See Figure 2.)

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*Organized by the Editorial Committee of the California Cancer Commission.

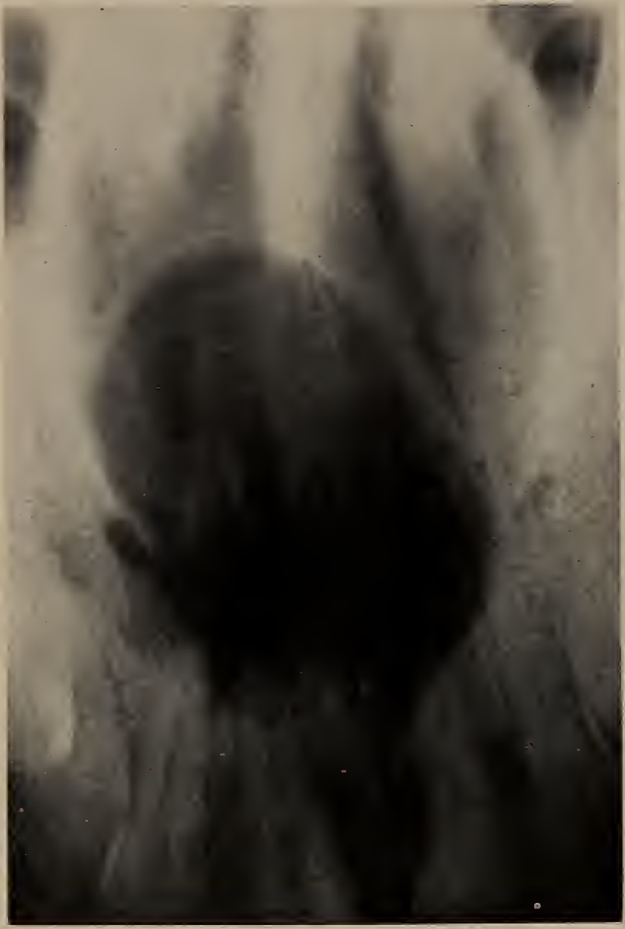

Figure 1.—Median maxillary cyst.

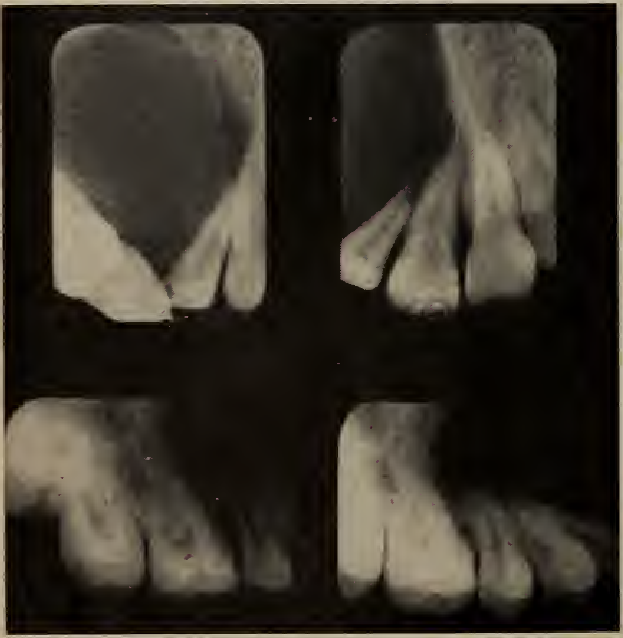

Figure 2.—Globulo-maxillary cyst.

3. *Incisive Canal Cysts:*

The incisive canal cyst, often called a cyst of the nasopalatine canal, is of developmental origin and occurs in the midline of the maxilla. Irritation or inflammation, with blocking of secretions within the canal, produces an epithelial lined cyst filled with mucoid or purulent secretion. Roentgenograms demonstrate a unicystic, spherical or heart-shaped radiolucent area in the region of the incisive canal.

Treatment of all cysts of non-odontogenic origin consists of the institution and maintenance of continuous drainage until the cavity has filled with new bone. Enucleation may be done on small cysts when it can be accomplished without injury to adjacent teeth, thus shortening convalescence. Care must be taken to remove the entire cyst membrane. Large cysts are best treated by forming a window into the dome of the cyst with the production of a permanent wide opening into the oral cavity. The cyst membrane is not traumatized, so that all surfaces are covered with epithelium, and the remaining part of the cyst becomes a part of the oral cavity. Epithelial repair is prompt and new bone gradually fills the defect or bone space until the surface has returned nearly to normal. In dealing with the relatively larger cysts, especially where vital tooth roots are involved, and a prolonged period of observation is assured, a small foramen may be devised by drilling through the most accessible wall of the cyst and fitting the opening with a so-called "collar-button" device, or other form of drain to maintain decompression until bone regeneration has been accomplished.

ODONTOGENIC CYSTS

Odontogenic cysts are the most common cysts of the jaws. They originate from dental anlagen or from various stages of tooth development, and may be composed of one or all the tissues which make up the normal tooth. Although they may be found in any part of the jaws, the most common site is the third molar region. These cysts are directly related to the teeth in contradistinction to the facial cleft cysts.

1. *Radicular Cysts:*

Radicular or periodontal cysts are related to erupted teeth only. They are invariably associated with infection at the root of the tooth and death of the pulp. This may follow an acute or chronic course depending on the infective organism, and may show a systemic reaction, a local inflammatory reaction or be practically asymptomatic. It is more common in the maxilla than the mandible, although it may be found in any portion of the alveolar ridge, and multiple cysts are common. These cysts may enlarge by absorption of the adjacent bone to project through the ramus of the jaw or perforate into the maxillary sinuses, and the larger cysts may surround the roots of several adjacent teeth. In the beginning there is destruction of bone with granuloma formation, followed by necrosis and liquefaction of the central area and the formation of an epithelial cyst membrane.

Roentgenograms demonstrate a distinct, nontrabeculated dehiscence or radiolucent zone of varying size around the apex of the root of an erupted tooth. The peripheral margin is well defined by an osseous condensation which shows as a fine white line on the film.

Treatment consists of removal or resection of the tooth with complete destruction of the lining epithelium. (Figures 3 and 4.)

2. *Follicular Cysts:*

Follicular or dentigerous cysts are formed from the epithelium of the enamel organ, usually affect teeth before eruption and are, therefore, most commonly found in young people. When the lesion arises from the enamel organ at an early stage, the tooth itself does not develop and a simple follicular cyst is formed. In the later stage of development the cyst surrounds the crown of the tooth (dentigerous cyst) or even the entire tooth, and, by extension, several teeth may be involved. Completely embedded cysts are usually sterile.

Roentgenograms demonstrate a radiolucent, single or multiloculated area with a border of condensed bone. The third molar, cuspid and premolar regions are most frequently involved. Follicular cysts may be differentiated from others by their location, their greater size, and the associated teeth.

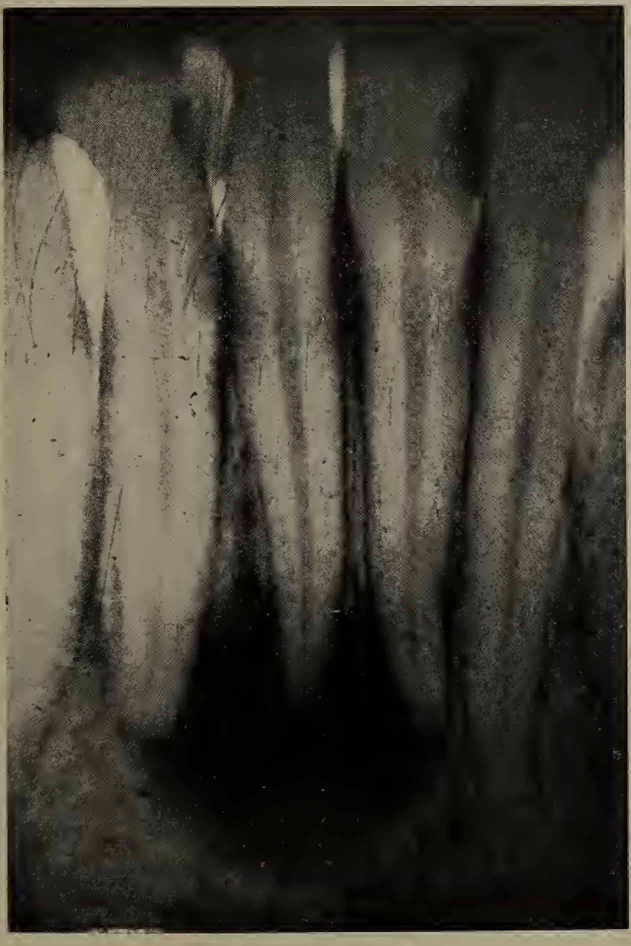

Figure 3.—Radicular cyst.

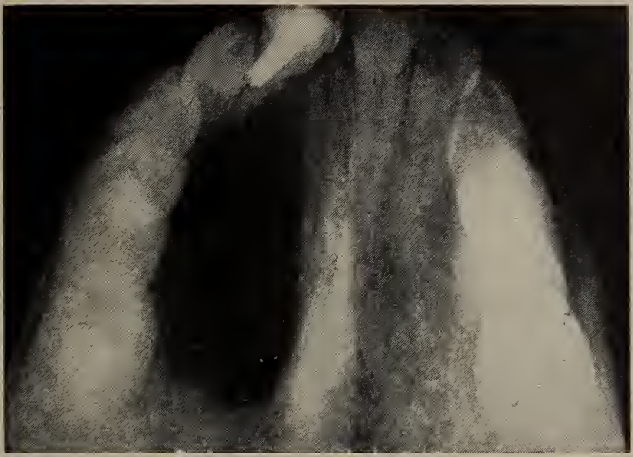

Figure 4.—A radicular cyst arising from the root of the left central incisor tooth in the maxilla, and destroying the greater part of the hard palate on the left side.

Treatment is imperative and should be performed promptly with removal of the involved tooth and a thorough destruction or removal of the entire epithelial lining, else the cyst will recur. A cyst of this type is the most prone to undergo malignant change with formation of an ameloblastoma or occasionally a squamous cell carcinoma. (Figures 5 and 6.)

DERMOID CYSTS

Dermoid cysts are of embryonal origin formed by an infolding of the epiblast, and the buried tissue produces dermal appendages and mesoblastic tissues, of which those normally associated with the jaw and mouth are most common. Progressive enlargement of the jaw is one symptom. Pain is a late symptom. The cyst is composed of a fibrous sac with an epithelial lining, containing various dermal structures. Roentgenograms may disclose numerous teeth and a part or an entire jaw within the cyst cavity. As these cysts tend to increase in size with destruction of adjacent tissue and to cause deformity, complete removal of the entire sac is necessary.

ODONTOGENIC TUMORS

Tumors of odontogenic origin may be either benign or malignant and treatment of them is varied. A definite diagnosis is always essential in order that proper treatment may be promptly instituted.

1. *Odontoma:*

The typical growth is essentially a mixed tumor consisting of an overgrowth or misplacement of the enamel, dentin, cementum, or a combination of two or more of these tissues. In the more simple forms there may be only a protuberance on an otherwise normal tooth, appearing more like hyperplasia than neoplasm. In other cases all tissues of the tooth may be so seriously disturbed that the growth bears little or no resemblance to a tooth, or it may produce multiple tooth-like structures. The degree of abnormality depends on the severity and the stage of development at which the disturbance takes place. The resulting tumor may be hard, soft or cystic. Roentgenographically the cystic type is quite similar in appearance to the dentigerous type of follicular cyst, except for the content, which shows rudimentary rather than fully developed teeth. The solid type varies from a radiolucent zone with possible denticles to a cementum-amorphous mass with or without a radiolucent zone about it.

Treatment requires the complete removal of all rudimentary structures, together with the capsule; and if there has been extensive bone destruction, primary or secondary repair may be required. (Figure 7.)

2. *Cementoma:*

Cementomas are benign growths originating from the periodontal membrane about a root. Inflammation or trauma may be an etiologic factor. They occur in the incisor area of either jaw, more commonly in the mandible, and are associated only with vital teeth. The growth is usually symptomless until there is pressure on a nerve. In the early or fibrous stage, roentgenograms show a radiolucent area, often resembling that seen in roentgenograms of radicular cysts. As the disease progresses there is a zone of increased density, and in the mature state there is a characteristic radiopaque mass surrounded by a narrow radiolucent zone which distinguishes it from osteitis or osteoma.

Treatment, which is required only after symptoms have developed, is complete removal of the growth. (Figure 8.)

3. *Ameloblastoma:*

Ameloblastoma (adamantinoma or adamantoblastoma) is a malignant tumor derived from epithelium that has the power to differentiate into enamel epithelium without actually forming enamel. It is more common in the male than in the female, and fully 80 per cent are found in the molar area of the mandible. The average age at the time of diagnosis is 30 years, although cases have been reported in patients from 6 to 75 years of age. It is usually characterized by a bony swelling, visible inside the mouth or even externally, which grows slowly, often over a period of several years. The adjacent teeth become distorted, but ulceration is observed only in an advanced stage of the disease.

Roentgenograms reveal a radiolucent area, usually multilocular or multicystic in appearance, with bony trabeculae present and a well demarcated margin. The monocystic type is often difficult to differentiate from an odontogenic cyst, as one or more teeth may be completely enclosed in the tissue. How-

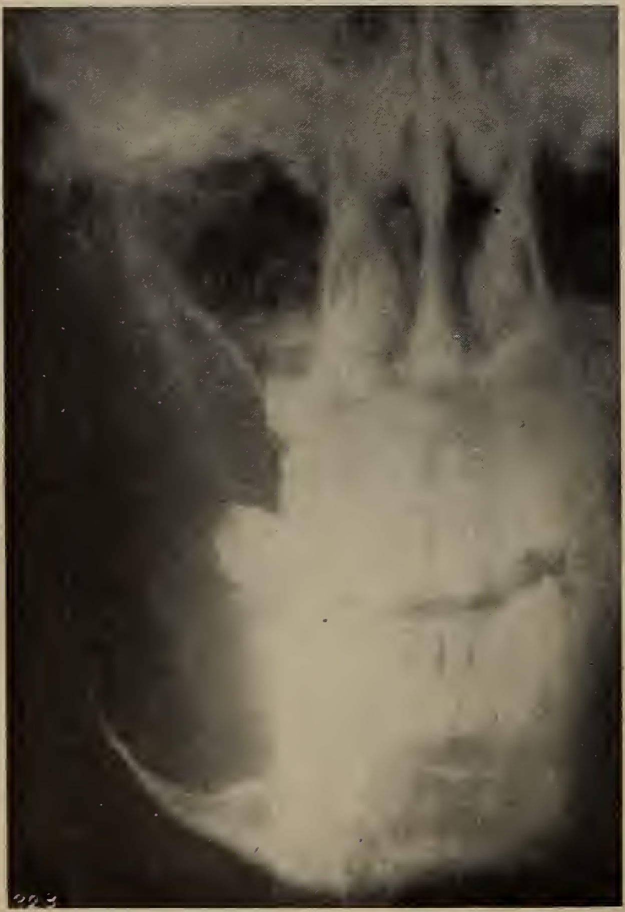

Figure 5.—Follicular cyst arising from the right lower third molar tooth and destroying the horizontal and ascending ramus of the mandible.

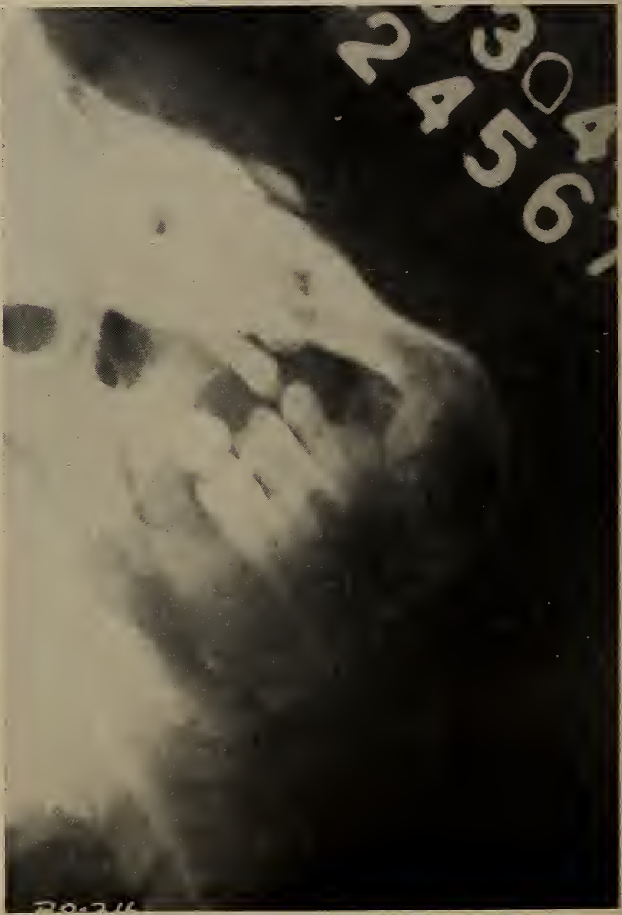

Figure 6.—Multiple follicular cysts of the mandible.

ever, careful review of the roentgenogram will usually disclose a notch in the cyst wall or small satellite cysts about the margin of the larger cyst.

Although the growth is ordinarily slow, it may become accelerated at any time, assuming characteristics of either carcinoma or sarcoma. Growth is usually by direct extension, with a tendency to distend rather than destroy the jaw. However, metastases to lymph nodes, lung, and other distant areas have been noted.

Diagnosis is determined by clinical findings, roentgenogram and biopsy. The resemblance to benign lesions and the difficulty in differential diagnosis make a biopsy in any suspicious lesion imperative. Early diagnosis and treatment are necessary in order that the life of the patient may be saved with the least resulting deformity. The tumor is treated as a local malignancy, and recurrence is the rule unless removal is radical. Excision should always be carried through healthy tissue. While it is desirable to maintain the form and support of the jaw, it is better to replace the entire section with a bone graft than to perform an inadequate removal. Ameloblastoma of the maxilla, although less common, is more serious and requires resection of the entire maxilla. (Figures 9 and 10.)

4. *Alveolar Giant Cell Tumor:*

The alveolar giant cell tumor (epulis) arises from the periodontium at the neck of the tooth. It is related to odontoclastic activity which occurs during the resorption of deciduous teeth, or around diseased teeth in adult life. In the early stages it has a reddish-purple color and contains numerous multinucleated giant cells, while in the more mature growth it is firmer, lighter and composed principally

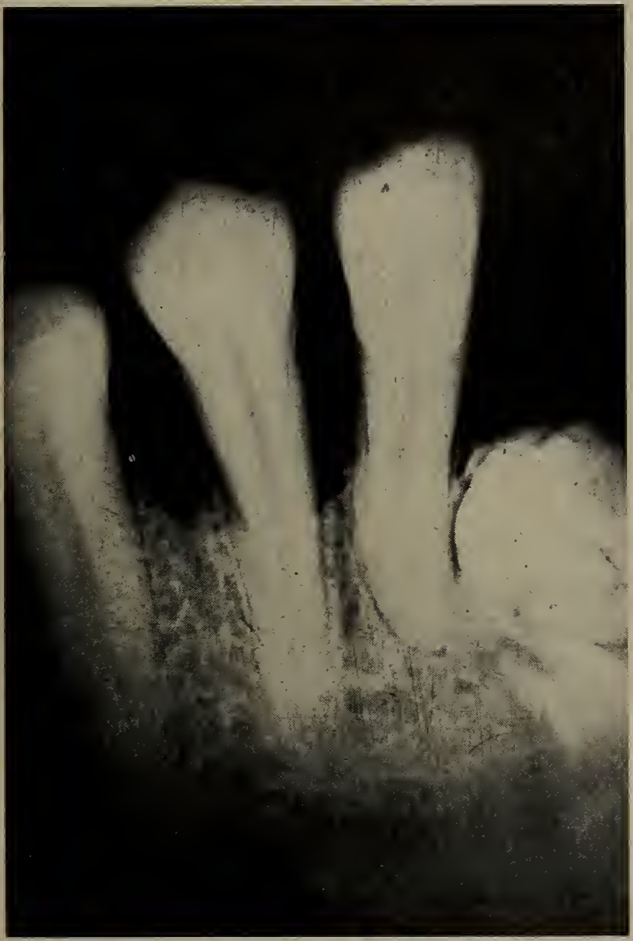

Figure 7.—A solid, composite odontoma.

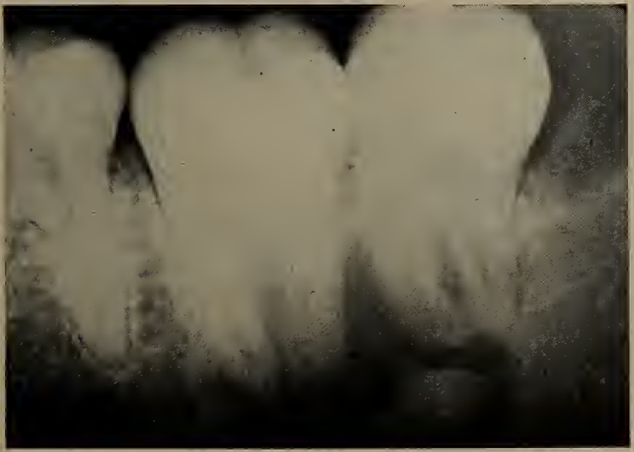

Figure 8.—A mature and symptomless cementoma.

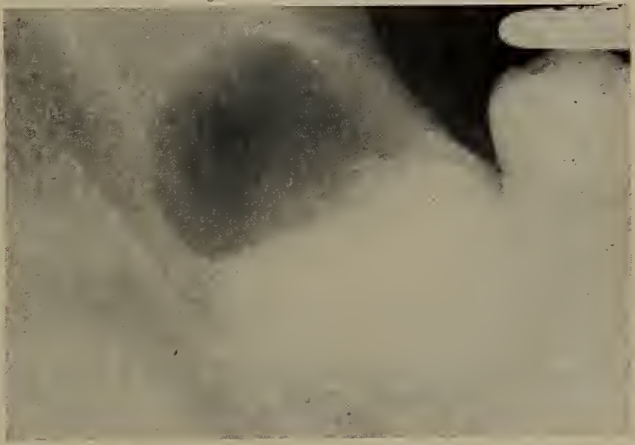

Figure 9.—A unicystic ameloblastoma.

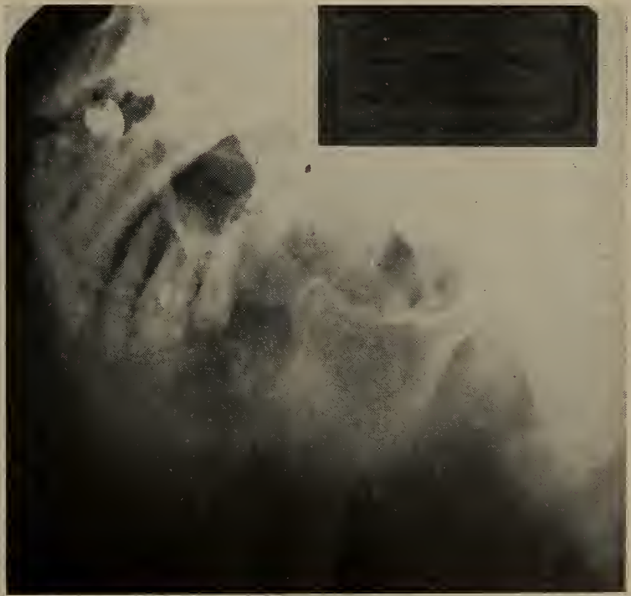

Figure 10.—Ameloblastoma arising in a follicular cyst.

of fibrous tissue. The marginal type is found with its base on the neck of the tooth and margin of the alveolus. The central type develops within the alveolus and remains centrally located until the growth loosens the tooth or pain from the expansion necessitates extraction. Roentgenograms show bone destruction from pressure. Bone spicules can often be demonstrated. Biopsy is necessary in establishing the diagnosis, as only in this way can a fibroma, papilloma or granuloma be differentiated.

Treatment. Extraction, thorough removal and cauterization of the base will effect a cure. However, if the tooth is vital, roentgen therapy or surface radium may eradicate the lesion without loss of the tooth. (Figure 11.)

OSTEOGENIC TUMORS

Osteogenic tumors of the jaws resemble those seen in other parts of the skeleton. They arise from cells in the periosteum or from osteoblasts in the cortical bone.

1. *Exostosis:*

An exostosis is a localized overgrowth of otherwise normal osseous tissue. Torus palatinus is an outgrowth of the median raphe of the hard palate. It is usually symmetrical, nodular and covered by mucous membrane. Growth is slow and symptomless and it is often unnoticed unless it interferes with proper fitting of an upper denture.

Torus mandibularis is an outgrowth on the inner surface of the mandible near the symphysis or along the premolar area. It is usually bilateral and symptomless.

Multiple exostoses may be found projecting from the outer or inner surfaces of the maxilla or mandible. These often develop during childhood and cease growth at puberty.

Roentgenograms show dense shadows in the region of the growths, which in some cases have the opacity of cortical bone.

Treatment is required only when the size and location of the growths cause discomfort or interfere with the proper fitting of dentures. The growths may be excised, but over the hard palate care must be taken not to produce a perforation into the nasal cavity. (Figure 12.)

2. *Osteoma:*

Osteoma is a true benign osteogenic tumor composed of cortex or spongiosa. It may occur within any portion of the maxilla or mandible or may be attached to the cortex by a pedicle. It is slow growing, well circumscribed, and usually painless.

Roentgenograms show an increased density with bone deposited parallel to the periosteum, and without the spiculed appearance of the malignant growth.

Treatment is elective after the diagnosis has been established and should be limited to the restoration of a normal appearance as there is little danger of recurrence after the patient has reached the age of maturity. (Figures 13 and 14.)

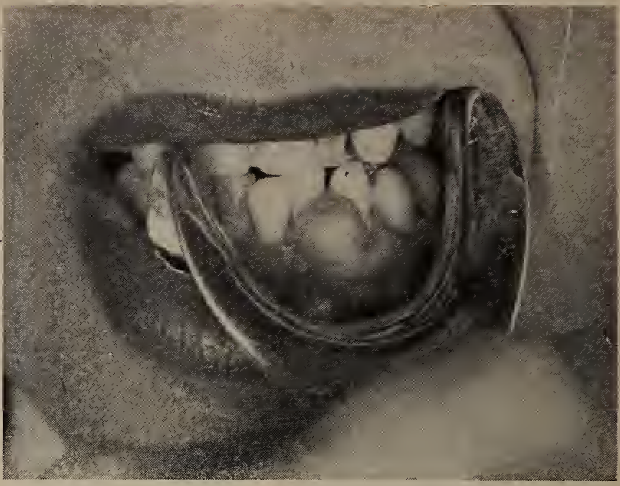

Figure 11.—Marginal alveolar giant cell tumor.

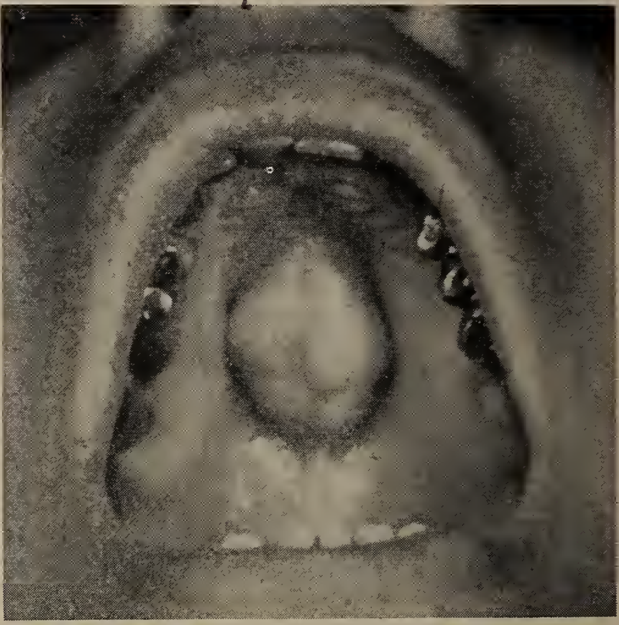

Figure 12.—Torus palatinus.

3. *Osteogenic Sarcoma:*

Osteogenic sarcoma is derived from any embryonal bone cell in any stage of development up to the osteoblast, and therefore includes a wide variety of cell forms. It is a rapidly growing, solid tumor, showing early invasion of bone and adjacent soft tissue. Pain is an early symptom. This tumor is malignant and causes great local destruction but metastasizes later than osteogenic sarcoma in other parts of the body. Although rare, it may be found in either the maxilla or mandible.

Roentgenograms show a lesion, usually solitary, with osteoclastic and osteoblastic features. It is lacy, mottled and has an irregular edge which may be confused with the characteristics of early osteomyelitis. There is destruction of cortical bone early, with invasion of the soft tissues.

Treatment requires radical resection of the involved maxilla or mandible with adjacent muscles and soft tissues as tumors of this type are highly malignant tumors and the percentage of cures is very small. (Figure 15.)

4. *Central Giant Cell Tumor:*

True central giant cell tumors may occur in the maxilla or mandible as in other bones of the skeleton. They are symptomless until there is periosteal irritation or nerve involvement, usually manifested by numbness of the lips. Unlike the alveolar giant cell tumor, it is most frequently seen in bone that is preformed in cartilage, near the symphysis angle or condyloid process of the mandible or the inferior turbinate, ethmoid or sphenoid sinuses.

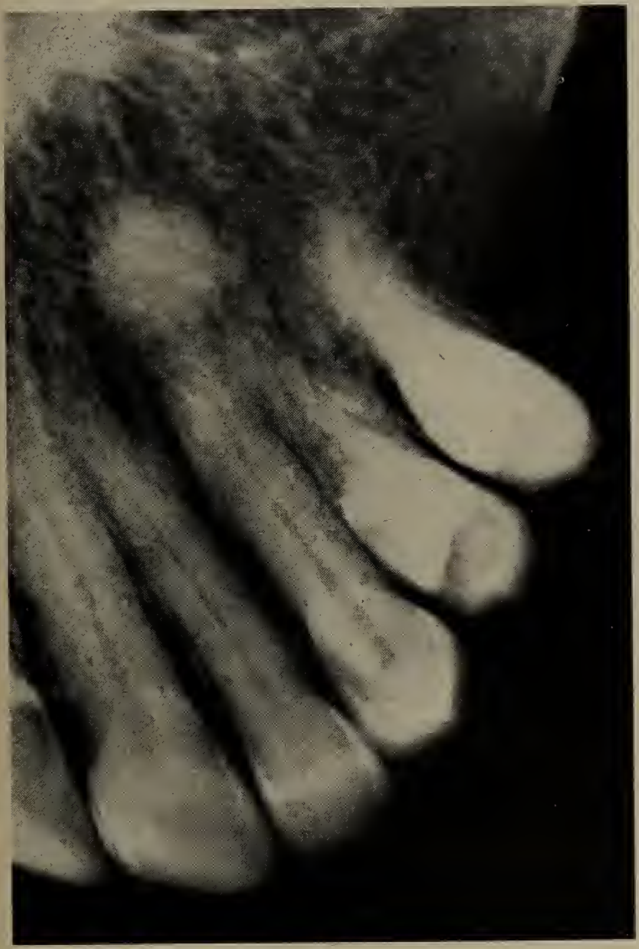

Figure 13.—Osteoma.

Roentgenograms show local destruction of bone, often with bone spicules, but the evidence is not sufficiently characteristic to differentiate central giant cell tumors from other lesions.

Treatment is conservative, either repeated small doses of roentgen radiation or local curettage with cauterization of the surface. Unless destruction is complete, there will be local recurrence.

5. *Endothelial Myeloma:*

Endothelial myeloma (Ewing's tumor) may be of solitary or multiple origin. It is found usually in persons under the age of 25, and the first symptoms are usually of a neuralgic character. This rare tumor is cellular, soft and often quite vascular.

Roentgenograms in the early stage may give evidence typical of osteomyelitis. Later there is lateral displacement of the cortex, with bone destruction.

Treatment consists of radical excision.

6. *Multiple Myeloma:*

Multiple myeloma is the term applied to tumors formed from bone marrow cells. Such tumors usually produce extensive involvement throughout the skeleton. Unlike endothelial myeloma, these tumors seldom occur in persons under 25 years of age. The mandible is commonly involved. Radiographically, multiple punched-out lesions are seen, as the lesions are osteoclastic. The finding of lesions in other bones confirms the diagnosis.

Treatment is entirely palliative—by roentgen therapy and symptomatic medication.

SECONDARY MALIGNANT TUMORS

Metastatic malignancies in the jaws in the presence of known primary or metastatic lesions elsewhere in the body seldom constitute either a diagnostic or therapeutic problem. However, there is an occasional case in which such a metastatic growth may constitute the first symptom known to the patient and the first evidence found by the physician.

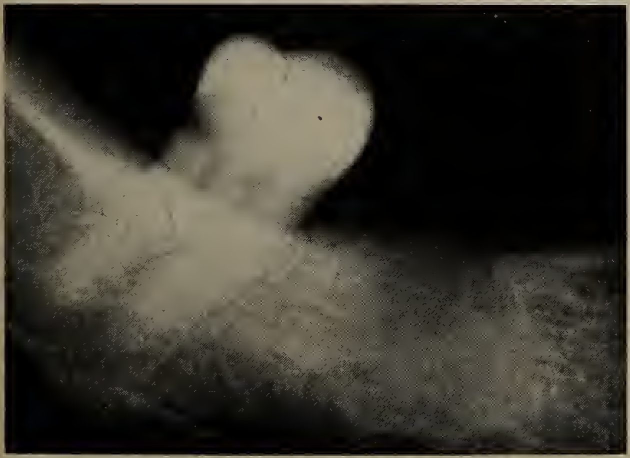

Figure 14.—Osteofibroma.

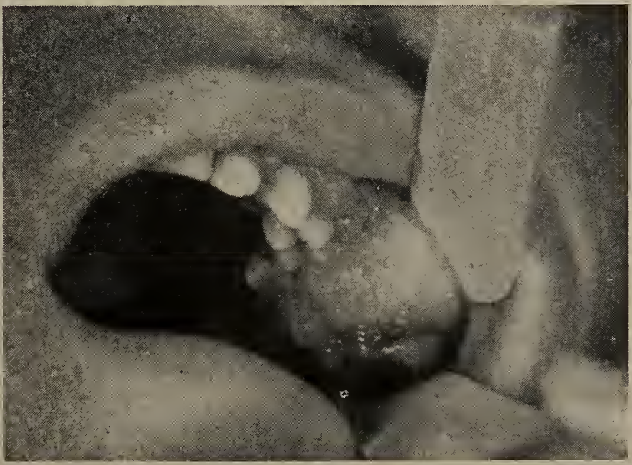

Figure 15.—Periosteal-osteogenic sarcoma.

There is nothing characteristic in these lesions, and diagnosis can be made only by biopsy and histologic examination, which may give the clue or at least the stimulus for the search for the primary lesion.

Because diagnosis of these as well as other tumors and cysts of the jaws can be accurately made in no other way, it must be again emphasized that a biopsy specimen be taken in every case.

1. *Metastatic Carcinoma:*

Bone metastases may be seen secondary to a primary squamous cell or adenocarcinoma in any part of the body. A small percentage of these are found in the jaws, where they may have osteoclastic or osteoblastic characteristics. The tumor may fill the marrow spaces without causing bone destruction of sufficient extent to be visible in a roentgenogram. Those most commonly seen are from primary lesions in the breast, prostate, thyroid, lip and gum.

2. *Metastatic Lymphosarcoma:*

Bone metastases occur in 1 per cent of cases of lymphosarcoma, and a few of these have been found in the jaws. Metastases in the jaw from other types of sarcoma are extremely rare.

SUMMARY

Cysts and tumors of the jaw occur more frequently than is generally recognized.

Early treatment of benign lesions of the jaws prevents deformity and injury to healthy teeth.

It is the responsibility of physicians and dentists to be alert for the first signs of tumor growth.

"Cancer of the Ovary and Fallopian Tube," by Erle Henriksen, M.D., Chapter XXVI of the California Cancer Commission Studies, will appear in this section in the February issue of California Medicine.

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EDITORIALS

Medicine On the March

Physicians throughout the country, and in California in particular, have cause to take heart at the progressive and aggressive actions taken by the House of Delegates and Board of Trustees of the American Medical Association at the St. Louis Interim Session.

In rapid order these two bodies:

1. Adopted a Statement of Policies which reaffirms the belief in the voluntary system of providing insurance against medical care costs and points to the pitfalls in a political system for this purpose.
2. Divorced the Washington A.M.A. office from the Council on Medical Service and placed it directly under the Board of Trustees.
3. Voted to expand the personnel, facilities, scope, activities and influence of the Washington office.
4. Voted to establish a nationwide campaign of public education to acquaint the American people with the true facts of medical care under private or governmental systems.
5. Established a Planning Committee consisting of representatives of the Board of Trustees and the House of Delegates, to provide over-all planning for the Association's activities.
6. Voted to raise the necessary funds through an assessment of $25 against every A.M.A. member.

These capsules contain the concentrated thinking and acting of the two hundred-odd members of the House of Delegates and the official family of the A.M.A., a concentration which was in the air at St. Louis and which covered twenty-four hours of each day. Activity was everywhere. Thinking was clear and decisive. Willingness was paramount.

California doctors have seen this process before, right in our own House of Delegates in its meetings of January and May, 1945. They have seen the same will to resist the socialization of medicine rise spontaneously from a large body of representatives in practically unanimous fashion. They have witnessed the raising of funds through membership dues and have seen the membership rolls burgeon rather than wilt under such a movement. They have seen, they have taken part in, the transition of the medical profession from a purely scientific body to a key instrument in the economic and political structure of the state.

Today, California physicians can look on at the same metamorphosis taking place in the American Medical Association and all its component state and county societies.

The experience of California is being drawn upon in the A.M.A. campaign. Doctor John W. Cline is one of three members of the A.M.A. House of Delegates selected to sit on the Planning Committee. Doctor Dwight H. Murray is the nominee of the Board of Trustees to exercise personal supervision over the expanding operations of the A.M.A.'s Washington office. It is fortunate that two busy practicing physicians are willing to devote their own time and efforts in this campaign, at the expense of their own interests and for the benefit of all the medical men in the country. The thanks of the profession are due them.

Cheering as is the news from St. Louis, let us not delude ourselves as to the magnitude of the problem. President Truman has repeatedly announced his intention of securing the passage of compulsory health insurance legislation. Oscar Ewing, head of the Federal Security Administration, started campaigning for socialized medicine before the November ballots were taken, and immediately after the votes had been counted, he was thumping the tub for his pet scheme to elevate himself to medical czar of 147,000,000 Americans. The hackneyed phrase "a mandate from the people" has already come out of mothballs.

Medicine faces the task of meeting this political pressure by educating the American people in the true meaning of what compulsory health insurance will bring in its wake. Regimentation of the professions and the public, restriction of personal liberty of all of us, bureaucracy in the meanest sense of the term, deterioration of scientific standards, invitation to further socialization, creation of an all-powerful central government—these are some of the possibilities which the medical profession is now bound to present to the American people, 147 million of them. This is the task cut out for medicine, a task now recognized by the A.M.A. and one which must not be shirked. There are millions of people and millions of miles to be covered, but covered they must be if the story of medicine and the story of a nation conceived and developed in the tradition of private enterprise are to be heard.

Medicine must remain a scientific profession but it must recognize that to remain scientific it is now necessary to become an economic unit, to create a voice which will be heard in the four corners of the country, to become militant in the public interest. This is not a case of self-protection; medicine knows that what is good for the public is good for the profession, and state medicine has yet to prove, in more than sixty years of trial, that it can achieve for the public anything approaching the result of an unfettered profession working under a private enterprise system.

The A.M.A. session proved that medicine can become militant when it sees the way. The will is there, the spirit present. All that remains now is for the profession as a whole to get behind the movement and put medicine on the march.

* * *

In the Beginning

For the convenience of readers, California Medicine, starting with this issue, will print the summaries of articles at the beginning rather than at the end of the article. This cannot be done in all cases, of course, for some articles either do not lend themselves readily to succinct summarization or would be spoiled for the reader if some measure of the contents were made known to him in advance; but with these reservations, it will be done where it can be done.

The purpose of this change is to give the reader a means of judging, at the time he reads the title of an article, whether or not he might expect to profit by reading further.

Behind the decision to make the change was the knowledge that many readers commonly read the title and then turn to the summary for indication as to the value of the full article to them. It is thought that putting title and summary on the same page will aid in accomplishing the same purpose less cumbersomely.

Although admittedly a departure from convention, the new arrangement is not pioneering on the part of California Medicine. At least two other scientific journals, *The Journal of Chemical Physics* and *The Journal of Applied Physics,* for some time and apparently without unhappy reverberation have been printing summaries at the beginning of articles.

If the new pattern is less logical than it now appears to be, California Medicine anticipates that it will not be long in hearing of this from its subscribers.

Letters to the Editor . . .

Impressions from the Rural Health Conference

San Francisco

Editor, California Medicine

Dear Sir:

It was my privilege to attend the second Rural Health Conference of the State of California held at Sacramento on October 16, 1948. I shall not try to review individual papers, as these probably will be published, but I did see in this meeting the possibility of a cooperative piece of work by medical personnel and others interested in health and welfare that could follow our American pattern of development and also remedy most of the ills of maldistribution of health in this vast country of ours where the problems are so numerous and difficult. It was ably pointed out by Mrs. I. H. Teilman that such a cooperative scheme should start at the local community, the small town, village or rural area that functions as a unit. The functioning body at that level should be a health council consisting of those individuals within the community who are concerned most vitally with health problems, namely the practicing physicians, dentists, the public health officer, the nurses, members of other health organizations such as Tuberculosis Association, Mental Hygiene Association, and other community organizations that have committees concerned with health and welfare such as the American Legion, civic and women's clubs. In some communities the health council may consist of only three or four individuals; in others it may be a much larger group. The function of such a council should be to study the local needs and strive for the fulfillment of those needs in every way possible whether this be through local pressure on city officials, whether it be legislative measures at a state or national level, or whether it be the activation of groups within its own community.

Upon the doctors and dentists rests the responsibility of studying their own needs, such as adequate hospital facilities, adequate laboratories and other essential equipment. These professional people, through the aid of the health council and its educational opportunities in the community, have a much greater chance of obtaining their objectives than without such aid. Requests from local groups of doctors to medical centers for diagnostic and educational help will hardly be refused. The medical schools and medical educators as well as other physicians in the large centers who are in active teaching and research have the organization or at least a basic pattern for expansion of its personnel to meet these demands. It should be recognized that medical education is a continuous process and that people in medical education have a responsibility toward the practicing physician that is continuous throughout the period that a physician serves the health needs of his community. The larger medical centers, upon requests from local physicians, should furnish aid in laboratory diagnosis, x-ray diagnosis, consultations, ward rounds, lectures and medical conferences. Only in this way can the rural physicians discuss with specialists local problems at a local level. It should also be possible to bring many hospitals in the rural areas and small towns up to approved status where those young physicians who wish to practice in rural areas may have the benefit of seeing that rural practice in action while they are still in hospital training and where they may have the opportunity to participate in well child conferences and other rural or semi-rural health activities in the area. A better program for the training of general practitioners and rural practitioners could then be developed.

The role of nurses, both those working in a small hospital and those who are married and living in the community, and their cooperation to furnish adequate help to a hospital, was very ably presented by Mrs. Gabrielle T. Mulvane and should offer many suggestions to those interested in the acute shortage of nurses.

The health council can also make demands upon the local public health services, for this organization has a very definite responsibility to protect the general health of the community; particularly the safety of water supply, milk supply and prevention of diseases of animal origin that may be transmitted to man or from man to man. The public health service also serves an important function in its statistical studies of diseases. It is in a position to point out to the profession the needs and the possible solutions to those needs. Important in such statistics are infant and maternal mortality rates and prematurity. The demand from the rural areas on the one hand and the vision of the educators and public health services on the other should dovetail in such a manner that most areas of the state are covered with this network of medical care, thus retaining our pattern of individual endeavor, personal responsibility and cooperative effort without too great interference from either the state or the federal government.

What Margaret Mead in her book "Keep Your Powder Dry" stated concerning the country's military emergency might equally well apply to our health problems: "On the home front, every good sized community, every city, can tackle its own problems, get its own civilian defense going, organize its own housing and settle its own feeding problems without waiting for Washington like so many helpless and spineless invalids waiting to be lifted from one deck chair into another." And in another place: "To win this war we need the impassioned effort of every individual in the country; to get that effort it will be necessary to throw the ball to the people of the small towns and the large, of the farms and the mines."

This type of solution to our health problems need not be a mere dream, the pattern is already set in a few areas; other communities need only to follow the example.

H. E. THELANDER, M.D.

384 Post Street.

E. Coli Antibiotic

The increasing difficulty of harmonizing classical immunologic theory with clinical data in enteric infections has led to renewed interest in earlier theories of enteric immunity. Thus, Shaughnessy[6] and his associates infected adult human beings with graded oral doses of living, virulent Shigella paradysenteriae (Flexner) bacteria, about two weeks after having immunized them by subcutaneous injections with non-viable homologous vaccine. No significant clinical resistance was noted in these tests. Specific agglutinins, however, were found. Hardy[3] conducted similar vaccination experiments in institutions caring for feeble-minded and psychotic patients where Shigella infections were prevalent. No significant clinical or bacteriological immunity was noted against the naturally occurring infection. The conclusion was drawn from both of these experiments that circulating antibodies play a negligible role in anti-dysentery immunity.

The earlier theories thus revised pictured enteric resistance as due largely to the antagonistic action of normal intestinal saprophytes. This theory was recently strengthened by the demonstration by Heatley and Florey[4] of Oxford University, that certain strains of E. coli give off antibiotic substances which are both bacteriostatic and bacteriocidal against Eberthella typhosa, Shigella shiga and other enteric pathogens.

In order to throw light on the probable clinical role of such antibiotics, Halbert[2] of the University of North Carolina made a survey of the presence of antishiga strains of coliform bacilli in rectal cultures from 147 children under ten years of age in seven different towns in Hidalgo County, Texas. The specimens were obtained from presumably healthy subjects. In all, 1,243 coliform strains were isolated and tested for their inhibiting and bactericidal effects on Shigella paradysenteriae (Flexner III) grown on the surface of nutrient agar. Some of the organisms showed no antishiga effects whatsoever. About 8 per cent of them produced small zones of shigella inhibition up to 2 mm. wide. Ten per cent of the coliform strains produced inhibition zones as wide as 6 to 7 mm. Concentrations of human or rabbit blood as high as 25 per cent did not significantly affect the size of the inhibition zone.

A single case of acute diarrheal disease was studied with relation to the presence or absence of these antishiga coliforms. During the course of the disease there was a profound change in the coliform flora, in the direction of the development of organisms which showed an even greater degree of antagonism to the dysentery bacillus. This shift in the character of the flora paralleled the process of recovery, suggesting that the coliform bacilli played an important role in this recovery.

The prophylactic and therapeutic use of antibiotics produced by these coliform bacteria was suggested over 30 years ago by Nissle.[5] The possibility of producing a usable antibiotic from such strains was therefore tested by Halbert[2] and his associates. They found that very low titer antibiotics were produced by growing coliform bacilli in deep broth. Very strong antibiotic titers were produced, however, by the same organisms when grown on the surfaces of 0.5 per cent nutrient agar. The yields were harvested after incubation at 37°C for 24 to 48 hours by one of the following methods: (a) The agar was allowed to thaw after rapid freezing in solid carbon dioxide. As much as one-half of the total volume of the agar was thus obtained as a crude liquor; (b) The agar was mashed by violent agitation and then centrifuged. About one-third of the total volume was thus obtained in fluid form; (c) the antibiotic was extracted by soaking the mashed agar for about one hour in distilled water.

The potency of the crude liquor obtained by the carbon dioxide method was often as high as 6,000 to 16,000 units on the penicillin scale. The crude antibiotic can be stored for as long as six months without deterioration. By adjusting its pH to 8, the crude product can be heated 100°C for 60 minutes or at 120°C at 15 pounds pressure for 15 minutes with only partial loss of titer.

The active component in the crude product is quantitatively precipitated by acetone or by 40 to 60 per cent saturation with ammonium sulfate, thus leading to a simple method for its concentration. Preliminary experiments show that the concentrate is relatively non-toxic. As much as 0.5 cc. of a concentrate containing 2,000,000 units of the antishiga antibiotic gives no recognizable symptoms when injected intraperitoneally into mice. Tests of the possible therapeutic use of this concentrate are now in progress.

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NOTICES AND REPORTS

Medical Public Relations and Government

Clem Whitaker, *Public Relations Counsel for the California Medical Association*

Every Californian, as most of you know, has an innate modesty, paralleled or surpassed only by the unassuming reticence of a good Texan.

It is this predilection for self-effacement and understatement which has caused us, in recent years, to deprecate the assumption that we have only the best things in California—and to admit that sometimes we also have some of the worst.

Any doctor or medical representative who has read some of the demagogic statements of some of our California politicians will know what I mean.

Seriously, California, with all its well-advertised sunshine, often turns a dark silhouette to the world. And no one knows it better than the doctors of California, who have been forced to fight a bitter battle to avert regimentation of their profession.

We have more than our share of crackpots, dogooders and patent medicine fakirs—and as a consequence, the contagion of compulsory health insurance took serious hold in our state somewhat earlier than in most others. We have therefore achieved the dubious distinction of becoming a testing ground for the socializers.

That, undoubtedly, is the reason I am on this program, and have been assigned the subject—*Medical Public Relations and Government.*

The subject is broad and my experience with it has been limited to California, but I will attempt to report to you how the fight has gone on our particular battleground. Some of our experience may be applicable in other states, but some of it may not. That is something you can evaluate much better than I.

California medicine experienced its own devastating Pearl Harbor Day back in January, 1945! The attack came without warning—and from a wholly unexpected quarter.

Earl Warren, a Republican Governor, who had enjoyed the confidence and support of most of the medical profession—a supposedly conservative Governor, at the peak of his popularity—suddenly demanded the enactment of a system of compulsory health insurance by the Legislature.

Governor Warren, at that time unbeaten on any program of legislation he had requested, served notice on medical leaders he was prepared for a fight to the finish—and demanded that they capitulate or face the threat of even more drastic legislation.

In that 1945 legislative battle, Governor Warren had powerful allies. His socialized medical program was supported by the California State Federation of Labor, by the CIO and the Railroad Brotherhoods; by several of the most powerful newspapers in the state, by the California League of Women Voters, and even by the conservative California Congress of Parents and Teachers.

Even staunch friends of the medical profession were fearful of the outcome. Many counselled surrender, believing it better to compromise and save something than to go down to complete defeat. The odds seemed hopeless.

How California medicine met that challenge is, I believe, one of the finest chapters in our state's hectic political history—a story which has new and reassuring significance today when the medical profession throughout the nation is faced with the prospect of a similar showdown battle in Congress.

I remember very vividly the first session of the Council of the California Medical Association which I attended, soon after New Year's Day in 1945. Our firm of Whitaker & Baxter had just been retained as public relations counsel for the C.M.A. And at that meeting, the Council was deciding on fundamental policies which would determine how 9,000 doctors conducted themselves in a fight to remain free men in the practice of their profession.

There were two vital and basic decisions reached at that meeting.

The first decision was that there would be no compromise, nor any surrender, under any circumstances. It would be a battle to the hilt, to the final

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Presented before the National Medical Public Relations Conference, St. Louis, November 27, 1948.

roll-call. And if medicine went down to defeat in the Legislature, it would carry the fight to California voters on the referendum. Bluntly and finally, the Council declared: "There can be no compromise on principles!"

It was a staunch answer, worthy of the best traditions of the medical profession—an answer which gave heart and dramatic impact to medicine's cause. It had a ring like Winston Churchill's immortal defy: "We shall defend our island, whatever the cost; we shall fight on the landing grounds, we shall fight in the fields and in the streets; we shall never surrender."

The second decision that day was designed to fortify the first, to back up C.M.A.'s legislative representatives at the state Capitol with a hard-hitting campaign of public education, designed to get the medical profession off the defensive and into an affirmative position.

Medicine needed allies, and needed them quickly. It needed the aid of business and industry, civic organizations, women's clubs, religious, fraternal and veterans' groups, newspapers and radio.

The normal public relations procedure, of course, called for starting from the grass roots and moulding public sentiment until it reached the top. But because of the shortness of time and the urgency of the situation, we built our house on a reverse floor plan. We started at the top and worked down; we reached out, with a small professional staff, and with hundreds of volunteers, to sell leaders in every walk of life on the soundness and rightness of medicine's position.

In three months, while the issue was pending at the Capitol, more than 100 powerful, state-wide organizations—the American Legion, the Veterans of Foreign Wars, the state Chamber of Commerce, the state Grange, the Agricultural Council, the California Taxpayers' Association, teachers' organizations, lodges, churches and farm bureaus—got into the crusade against socialized medicine and made their influence felt in the Capitol.

In three months, the number of newspapers supporting medicine's position jumped from 80 or 90 to more than 200—and more than 2,000 editorials and cartoons against compulsory health insurance were run in that 90-day period.

For three months, hundreds of doctors, members of the Women's Auxiliary to the California Medical Association, medical secretaries and friends of medicine spent every spare hour building public sentiment in their home communities. Doctors went from their offices or operating tables to speak before their luncheon clubs, their Legion posts, or their farm bureaus or chambers of commerce. Insurance men took time off from selling policies to sell the principles of voluntary health insurance as opposed to compulsory. Druggists talked to their customers, dentists to their patients.

At Sacramento, C.M.A.'s able, experienced legislative team, headed by Dr. Dwight Murray, now a member of A.M.A.'s Board of Trustees, and Ben Read, representative of the Public Health League of California, worked 18-hour days, talking to legislators, talking to their home constituents, rallying doctors throughout the 80 assembly districts and 40 senate districts to counteract the pressure being brought on legislators by the Governor's office and labor lobbyists. They reached out for help among the legislative representatives of business and industry and other organizations—and got it. They worked and fought without let-up.

Finally, when the roll was called, medicine won that fight in the state Assembly 39 to 38—by a margin of one vote! Legislatively, it was as great an upset as President Truman's victory over Tom Dewey. For the first time in his life, Governor Warren had gone down to defeat—and medicine had won the respect of the business community as a new, strong arm in the battle to save private enterprise.

Even before the Legislature adjourned, however, the House of Delegates of the California Medical Association met—and decided that continuing, constructive action must be taken to win the final victory. There were some very definite and well-considered objectives set forth.

It was agreed that *all* the people of California, not just the leaders in business and community life, must be told the facts of what socialized medicine would mean to them, in inferior medical care, in payroll taxes, in political meddling in their private affairs. The objective was to drive home the simple, understandable truth that political medicine is bad medicine—and that California should have none of it.

It was further agreed that the agitation for compulsory health insurance never would end, and that the battle could not be finally won until the people were convinced that the medical profession was taking leadership in providing prepaid, budget-basis medical care, and that government intervention was therefore unnecessary.

In effect, California medicine agreed that day that health insurance was coming, both in our state and throughout the nation, in the span of a very few years. The only question was whether it was coming on a voluntary basis, with proper medical safeguards, and with the medical profession administering it, or whether it was coming on a compulsory basis, with politicians at the controls.

It was decided that the California Medical Association would launch a public relations and advertising campaign, with paid newspaper space, radio, direct mail and intensive organization activity, to make the people of California health insurance conscious—and to convince them that the voluntary way was the American way to cope with the problem.

In carrying out that program, during the intervening years, the California Medical Association has staged *Voluntary Health Insurance Weeks* in 53 of the state's 58 counties, with the cooperation of city and county officials and community leaders. Medicine, the insurance industry and press have spearheaded the campaign; 120 mayors and 600 city councilmen have lent their names and influence to the drive. C.M.A. has published nearly 40,000 inches of paid newspaper ad copy in 420 daily and weekly newspapers—and approximately 30,000 inches of tie-in advertising has been donated by druggists, dairies, grocery stores, bowling alleys and even bars, to put over the Voluntary Health Insurance story.

California medicine, too, for the past several years, has had its own regular radio program on a state-wide network, reaching more than 500,000 people every Sunday afternoon. And the commercials, of course, have been selling California Physicians' Service, the doctors' own prepaid medical care plan. But in addition, on alternate weeks, we have clasped hands with the insurance industry— and sold their plans, too.

There's an interesting sidebar story in connection with C.M.A.'s radio program, which is called "California Caravan." Last year, "California Caravan" won the achievement award of the California Congress of Parents and Teachers for noteworthy service in contributing to "the best of family listening." Three years ago, that same organization, the PTA, was supporting compulsory health insurance—and was bitterly critical of organized medicine. Today they are working with us, promoting interest in our radio program through the schools and their hundreds of thousands of PTA members.

I have only attempted to sketch some of the high points of our public relations program in this brief presentation. There's been a tremendous amount of spade work done which all of you, in the public relations profession, recognize as essential. We have 700 newspapers in California; our men have been in every one of those 700 offices, talking to editors, selling medicine's story. We've called on 400 presidents of service clubs, 280 officers of veterans' organizations, 500 officers of women's clubs, lodges and civic organizations, 200 insurance company officials, and almost every city, county and state official in California.

The job is still unfinished, but we are making progress. The impact of a mounting public opinion has been felt in legislative chambers. There have been no more 39-to-38 roll-calls.

On medicine's Pearl Harbor Day, in 1945, California Physicians' Service had about 125,000 members. Today it has more than 600,000!

Four years ago, only about 2,500,000 California citizens were enrolled in voluntary health insurance plans. Today there are more than 100 voluntary health insurance systems operating in California, with over 5,000,000 insured members—a million more than Governor Warren promised to care for under his compulsory program.

We've come quite a way, but we're still not out of the woods. Our Governor, Earl Warren, who had hoped to go to Washington, is back with us—and we may have another showdown battle in the January session of our Legislature, but we are ready for the showdown!

We know this problem isn't peculiar to California, even though it may have been a bit more aggravated there. It is an Old World contagion which has spread to our New World—and which may menace not only the medical profession, but the health and economic and social welfare of our whole nation.

Medicine, today, is in the front lines in one of the most critical struggles in the history of our country—a basic struggle between two warring philosophies of government and economics. The fight is between socialism and capitalism, or communism and free economy. Call it what you will, it is a war to the death. But I have an abiding confidence in the soundness of the American people, if we get the facts before them. Congress won't decide whether compulsory health insurance is to become the law of this land; the people will decide that issue in the final analysis—and their decision will be the right decision, if the true story of American medicine is given them.

Rural Health Conference

The second annual Rural Health Conference was held October 16, 1948, at the Hotel Senator, Sacramento, California. The general theme of the conference was "The Role of Rural Health Councils," and regard was given particularly to the utilization of these councils as a means toward improving rural health and medical care.

In the address of welcome, Dr. Andrew M. Henderson, Jr., vice-president of Sacramento Society for Medical Improvement, said: "The physician has long been one of the leaders in social welfare work. . . . Now the physician is asked to be the leader in restoring to a sick and crippled world the strength to combat the forces that seem to threaten our democracy. In accepting the responsibility of this leadership, the medical profession through the American Medical Association and its state and county societies asks the help of every American citizen so that together we may work out a program of health for our country."

The chairman of the conference and of the California Medical Association special Committee on Rural Medical Service, Dr. Carroll B. Andrews, of Sonoma, reported upon "Rural Health Council Development." The analogy of this type of organization to the early town meeting, both functioning as typically democratic units, was pointed out. The major functions of the Council, Dr. Andrews said, should be: (1) Medical care; (2) Hospital development and improvement; (3) Public health and preventive medicine; (4) Education of youth for medical and related careers. Miscellaneous functions were listed as : (a) General welfare through promotion of nutrition, housing and recreation; (b) Maternal, infant and premature infant care; (c) Well child supervision; (d) Voluntary prepaid hospital and medical care plans; (e) Adult health education through the voluntary agencies. Dr. Andrews emphasized that the leadership in these councils naturally falls to the medical profession. The problem was crystallized by an address to the third Annual Rural Health Council, Chicago, February 8, 1948, by a quotation in part from Dr. Edward E. Elliott, president emeritus of Purdue University, "*The price that we are going to pay is the effort required to recapture our own sense of self-responsibility.*"

"The Physician and Rural Medical Care" was the chief subject of Dr. R. Stanley Kneeshaw of San Jose, president-elect of the California Medical Association. Dr. Kneeshaw emphasized that local organizations are far more successful in the proper solution of their local problems than national or "master" planning. A careful analysis of the various problems was presented. There are admitted deficiencies present, Dr. Kneeshaw said, but the people of the United States may be justly proud that its medical profession, working in a system of free enterprise, has attained international leadership. "We assume the leadership in this task [of providing a system of rural medical care] but in accepting this responsibility, the medical profession asks the help of the lay citizens so that together we can work out the problems of rural health," Dr. Kneeshaw said.

Dr. Roswell L. Hull, Hollister, emphasized in his speech, "Public Health Service for the Rural Community," that even small counties may have well organized efficiently functioning health departments with a physician health officer on a part time basis, if given wholehearted support by the practicing physicians and enlightened assistance of the citizens and organizations in the community.

Gabrielle T. Mulvane, R.N., San Bernardino, described in her speech, "Training of Registered Nurses in a Rural Hospital," the training program developed in San Bernardino County in cooperation with the San Bernardino Junior College. This has been a successful project in supplying well trained nurses for a relatively rural area. The recruitment of students must be a continuous process, she said, and proper integration of education in classroom and hospitals, personnel policies and adequate salaries are requisite.

Dr. William J. Kerr, professor of medicine, University of California Medical School, San Francisco, in his address, "Training of Physicians for Rural Practice," indicated the necessity for training and qualifying more medical graduates for general practice in rural communities. Doctor Kerr based his observations on his teaching experience and knowledge acquired from contacts with patients and physicians in Northern California.

He said that 25 years ago a modified preceptor system was reintroduced at the University of California Medical School in which a few medical students spent one month with a physician in general practice in a rural area. The war interrupted this program but it recently has been resumed.

Dr. Kerr outlined a flexible plan for training in the graduate years consisting of (1) one year rotating internship in a small, well staffed general hospital; (2) a second year spent chiefly in ambulatory clinics in general medicine, pediatrics, the allied specialties and preventive medicine; (3) a third year in the ambulatory clinics for surgery, surgical specialties, minor surgery, obstetrics and gynecology.

He pointed out that the early years of practice require supplemental postgraduate training and assistance in adapting to practice.

In closing, Dr. Kerr stated: "Such a program would require a concerted effort of several agencies. While I cannot speak for the University of California Medical School officially, I would be glad to present the problem to the governing agencies and would hope for wholehearted cooperation in a project which is of such great importance to the people and profession of our great state."

Honorable Allen G. Thurman, Senator from Colfax (a rural area) and a member of the Senate's Public Health and Safety Committee, a guest speaker, said that "a community, state or nation cannot be legislated into health." He pointed out that expenditures of tax money for highways, education and hospitals have a direct influence on health. He recommended that one or two outstanding physicians in each district be prevailed upon to serve on the local hospital district board. As to legislation, he said that "attempts to regiment the profession—attempts to bring politics into problems of health for the people—may give power and position to the politicians, but they are certain to lower the standards of care we here are all so interested in raising to the highest possible levels."

Dr. Charles H. Cutler, Sacramento, a pediatrician engaged in private practice, stressed in his speech, "Preventive Medicine for the Rural Child," the need for a minimum program for immunization and child health guidance and preventive medicine for children in the more rural areas. The physicians in general practice and the local health director must cooperatively avail themselves of such consultative services as may be arranged, he said. Dr. Cutler said there should be additional training of medical students and graduates in pediatrics. The need for health councils to integrate the over-all program, which is too complex for any single agency to deal with effectively, was pointed out.

Mrs. I. H. Teilman, of Selma, state health chairman, California Federation of Women's Clubs, outlined in her speech, "The Development and Functioning of Rural Health Councils in California," the experiences during the past three years in Fresno County in connection with the reorganization of the county health department. In this regard she said the solution of problems would have been greatly facilitated had a health council been set up as a preliminary step. "A health council," Mrs. Teilman said, "can be a great aid in solving some of the unmet health needs, such as adequate local health services, sufficient and accessible hospitals to take care of the chronically ill as well as the acutely ill, health centers in the communities too small to support a hospital, and, probably the most important, a school health program that extends through all twelve grades for the big city as well as every little red schoolhouse."

Dr. Ellis D. Sox, chief of the Division of Local Service, State Department of Public Health, San Francisco, described the interest of the State Department of Public Health in methods pertinent to rural health, indicating the possibilities of assistance by the Department and the Division of Health Education in developing health councils in an advisory and consultative capacity. "The local health department meets a need by providing certain services which cannot be furnished by the practicing physician alone," Dr. Sox said. "These public health services, however, cannot be provided by the Health Department alone and it is necessary to have the close cooperation of the practicing physician to a point where the Health Department personnel and the practicing physicians in the community become a team in providing good preventive medicine to the community. They are not in competition with each other."

Frank H. Weisman, assistant director of California Physicians' Service, San Francisco, described the C.P.S.-Grange prepaid medical and hospital service plan. He also presented other prepaid medical service plans available to rural populations and indicated the greatest problem at the present time is properly publicizing the availability of these programs to the farm groups and individuals.

A panel discussion on rural hospital planning ended the meeting. The subject "Private Hospital Development" was presented by Dr. N. T. Enloe, of Chico, on the basis of his experience since 1901 in Butte County. The problems of managing this same hospital were presented by Mrs. Anna Weast, hospital administrator. It was emphasized that high quality private hospital service at equitable rates can be maintained in a rural community where efficient, sympathetic methods are used. Dr. L. E. Heiges, Jr., of Lompoc, indicated that district community hospitals are serving the community in the same capacity as private hospitals, differing from them only in that the financial and managerial responsibilities are spread to the community through the board of directors. An interesting project instituted at Lompoc, he said, is that of training nurses' aides recruited from the young women of the community. Dr. Robert Dyar reported on the "Hospital Construction Program in California." He explained the means of determining eligibility and allocation of funds under the Hill-Burton Act. He listed ten projects designated for construction funds to supply 350 additional hospital beds in 1947-1948. In addition to this allocation the approval of nine additional projects for 1948-1949 will provide for approximately 260 additional general beds. This is a total of 600 beds in various stages of planning or construction under the provisions of Public Law 275. There are an additional 2,000 hospital beds planned for or in process of construction in the state to relieve the estimated shortage of 16,000 general hospital beds. Plans for assistance in the construction of facilities for mental, chronic disease, tuberculosis, and public health centers are being formulated and will be instituted during the 1949-1952 interval. Dr. Dyar emphasized the primary importance of a community organization such as a Rural Health Council to assist in developing and establishing adequate hospital facilities.

CONCLUSION OF THE CONFERENCE

The following conclusion was proposed by the chairman and accepted by the conference:

This conference has considered the means of improving the type of medical service to the rural areas of our state. To foster such improvements, voluntary rural health councils have been and are being organized throughout the United States and California. This type of council acts essentially as a cooperative steering committee made up of citizens who will mutually foster and promote the improvement of medical care facilities in their own areas. This conference has considered the most important subjects in rural health today. The program has covered the related subjects of increasing the number of well trained physicians to engage in rural general practice, providing nurses and the necessary hospital, laboratory and x-ray facilities and personnel.

It is hoped that the conference will provide sufficient ideas to be taken home and used in the farm neighborhoods to help the physicians, dentists, nurses and health officers to improve the health conditions and reduce illness by prevention rather than cure in an ever increasing proportion.

Respectfully submitted,

CARROLL B. ANDREWS, M.D.

Chairman, Committee on Rural Medical Service.

In Memoriam

BAILLY, THOMAS EDWARD. Died in San Francisco, November 15, 1948, aged 78, after an extended illness. Graduate of the Cooper Medical College, San Francisco, 1892. Licensed in California in 1892. Doctor Bailly was a retired member of the San Francisco County Medical Society, and the California Medical Association.

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FUTCH, CHARLES EDWARD. Died in Beverly Hills, October 25, 1948, aged 50. Graduate of the University of Michigan Medical School, Ann Arbor, 1923. Licensed in California in 1927. Doctor Futch was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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HAIM, ARTHUR. Died in San Francisco, October 28, 1948, aged 50. Graduate of Hamburgische Universität, Medizinische Fakultät, Hamburg, Germany, 1923. Licensed in California in 1936. Doctor Haim was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

JENNINGS, LAURENCE SHERMAN. Died in San Francisco, November 5, 1948, aged 34. Graduate of Rush Medical College, Illinois, 1939. Licensed in California in 1946. Doctor Jennings was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

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JOHNSTON, JAMES. Died in Los Angeles, October 25, 1948, aged 85. Graduate of the University of Toronto Faculty of Medicine, Ontario, 1884. Licensed in California in 1922. Doctor Johnston was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

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LEWIS, LLEWELLYN ROY. Died in Los Angeles, October 24, 1948, aged 58. Graduate of Northwestern University Medical School, Chicago, Illinois, 1916. Licensed in California in 1926. Doctor Lewis was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

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McCAUSLAND, WILLIAM SUMNER. Died in Chula Vista, November 7, 1948, aged 70, of cancer of the stomach. Graduate of the University of Pittsburgh School of Medicine, Pennsylvania, 1904. Licensed in California in 1922. Doctor McCausland was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

RAY, FREDERICK SYLVANUS. Died in Los Angeles, September 12, 1948, aged 66. Graduate of Johns Hopkins University School of Medicine, Baltimore, Maryland. 1908. Licensed in California in 1911. Doctor Ray was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

SLOCUMB, LEITH HOLLINGSHEAD. Died in La Canada, November 23, 1948, aged 64, of heart disease. Graduate of Washington University School of Medicine, St. Louis, Missouri, 1913. Licensed in California in 1938. Doctor Slocumb was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

THOMSON, DAVID. Died in Burbank, October 22, 1948, aged 65, of a heart attack. Graduate of Rush Medical College, 1914. Licensed in California in 1922. Doctor Thomson was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

* * *

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Leonard A. Barnard of Oakland was elected president of the Alameda County Medical Association at a meeting of the association in November, succeeding Dr. William G. Donald of Berkeley. Dr. Eric Reynolds was elected vice-president, and Dr. Dorothy Allen was reelected secretary for her fourth successive one-year term.

FRESNO

The appointment of Glenn W. Gillette, formerly a San Francisco public relations counsellor, as executive secretary of the Fresno County Medical Society, was announced last month by Dr. K. D. Luechauer, president of the society.

LOS ANGELES

Plans have been completed by University of California Extension for a new spring refresher course for laboratory technicians beginning Friday, February 11, at 7 p.m. in room 708 of the Hillstreet Building, 813 South Hill Street in downtown Los Angeles. The course will include 15 weekly meetings from 7 to 9 p.m. It will be a series of lectures for laboratory technicians, dealing with the most important recent developments in clinical laboratory practice. The course consists of 30 hours of instruction (lecture and demonstration) in the following fields: bacteriology, serology, biochemical methods, parasitology, protozoology, and hematology.

* * *

Dr. Burrell O. Raulston, dean of the University of Southern California Medical School, has been appointed to the 12-man National Advisory Heart Council by the Surgeon General, U.S. Public Health Service. Provided for in the National Heart Act of 1948, the Council will advise on the program of the National Heart Institute for controlling cardiovascular disease. It will collect information on research, advise on the development of research programs, and make recommendations to the Surgeon General on applications for grants to support research and training.

* * *

A one week postgraduate course in pulmonary disease, sponsored by the American Trudeau Society, will be held January 24 through January 29 at the new offices of the Los Angeles County Tuberculosis and Health Association, 1670 Beverly Boulevard, Los Angeles. The course will be presented under the auspices of the College of Medical Evangelists, the University of Southern California School of Medicine, and the University of California at Los Angeles Medical School.

* * *

Dr. John E. Bergmann has been elected president of the Santa Monica Bay District chapter of the Los Angeles County Medical Association. Other officers are Dr. George Bien, vice-president; Dr. John Vaughn, secretary-treasurer, and Dr. Howard Horner, librarian.

Dr. Donald C. Collins of Hollywood was elected a vice-president of the United States chapter of the International College of Surgeons at the annual meeting of that organization held recently in St. Louis.

MARIN

Dr. L. L. Robinson of San Rafael was elected president of the Marin County Medical Association at the annual meeting held in November. Dr. Alfred Schwartz of San Anselmo was named vice-president, and Dr. Carl Clark was reelected secretary. Directors elected are Dr. Warren Bostick, Dr. Anne Brady, Dr. Edward Campion, Dr. Howard Hammond and Dr. George Landrock. Dr. Robinson and Dr. Clark were named delegates to the California Medical Association annual meeting.

SACRAMENTO

The Sacramento Academy of General Practice was given a charter of membership in the American Academy of General Practice at a meeting in Sacramento last month. Presentation of the charter was made by Dr. Ivan C. Heron of San Francisco, president of the California Academy of General Practice, to Dr. John G. Walsh, president of the Sacramento chapter. The chapter has approximately 100 members.

SAN FRANCISCO

Dr. Edward B. Shaw of San Francisco was named president-elect of the American Academy of Pediatrics at a meeting of the Academy in Atlantic City late in November.

* * *

Dr. Dorothy W. Atkinson of San Francisco was elected president of the American Medical Women's Association at a meeting of the directors of that organization last month in New York.

* * *

Dr. Ivan C. Heron has been elected president of the San Francisco County Medical Society for 1949 to succeed Dr. Robertson Ward. Other officers elected by the Society at its annual meeting are Dr. Helen B. Weyrauch, first vice-president; Dr. Edmund C. Morrissey, second vice-president; Dr. M. Laurence Montgomery, secretary-treasurer, and Dr. J. Marion Read, historian.

SOLANO

Dr. Arvil E. Chappell was elected president of the Solano County Medical Society for 1949 at the recent annual meeting of the Society. Dr. Bernard O'Donnell was elected vice-president, and Dr. H. Lammel secretary-treasurer. Dr. Felix Rossi, who was president in 1948, and Dr. Carlton Purviance were elected delegates to the annual meeting of the California Medical Association, with Dr. Matthew Gibbons and Dr. H. Randall Madeley as alternates.

GENERAL

The first 1949 meeting of the California Conference of Local Health Officers is scheduled for February 23 and 25 in the Claremont Hotel, Berkeley. A block of rooms has been reserved for the meeting, and those wishing accommodations are asked to write directly to the hotel.

* * *

A total of 965 physicians attended ten one-day seminars on cancer which were held recently in various cities in California under the direction of the State Department of Public Health, the Cancer Commission of the California Medical Association and the California Division of the American Cancer Society. Meetings were held in Bakersfield, Santa Barbara, Long Beach, San Diego, Riverside, Redding, Sacramento, Stockton, Carmel and Fresno.

* * *

The first annual Mid-Winter Radiological Conference sponsored by the Los Angeles Radiological Society will be held in Los Angeles at the Biltmore Hotel on February 26 and 27, 1949. Reservations can be made by writing Dr. Donald Laing, 65 North Madison Avenue, Pasadena 1, California. The fee for the session is $15.

* * *

At a recent meeting of the Western Society of Electroencephalography held in Portland, Oregon, the following officers were elected: Dr. Robert S. Dow, president, Portland, Oregon; Dr. David Talbot, vice-president, Los Angeles; Dr. Nicholas A. Bercel, secretary-treasurer, Los Angeles.

* * *

The next written examination and review of case histories (Part I) for all candidates for certification by the American Board of Obstetrics and Gynecology will be held in various cities of the United States and Canada on Friday, February 4, 1949. Arrangements will be made, so far as is possible, for candidates to take the Part I examination (written paper and submission of case records) at places convenient for them. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination to be held May 8 to 14 inclusive, 1949, at the Hotel Shoreland, Chicago, Illinois. Notice of the exact time and place of Part I and Part II examinations will be sent all candidates well in advance of the examination date.

* * *

A new journal, Fertility and Sterility, to be sponsored by the American Society for the Study of Sterility, has been announced by the publishers, Paul B. Hoeber, Inc., medical book department of Harper & Brothers. The journal, which will be published bi-monthly beginning early in 1949, will be devoted to original articles, reviews and abstracts on the clinical problems of sterility and impaired fertility. Dr. Pendleton Tompkins, of San Francisco, is the editor.

* * *

The Pacific Coast Obstetrical and Gynecological Society announces that the third Frank W. Lynch essay contest will be held during 1949. It is open to men who have been in practice for less than ten years or who are not certified by the American Board of Obstetrics and Gynecology. The subject of the essayist is limited to original clinical or laboratory investigation in the field of obstetrics and gynecology. An honorarium of $100 is awarded, as well as the privilege of presenting the essay before the annual meeting of the Pacific Coast Obstetrical and Gynecological Society to be held in San Francisco during November. All essays should be submitted to the secretary of the Society, R. Glenn Craig, M.D., 490 Post Street, San Francisco 2, before August 1, 1949.

* * *

The Ninth Annual Essay Contest of the Mississippi Valley Medical Society will be held in 1949. The Society will offer a cash prize of $100, a gold medal, and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics and education) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents and citizens of the United States. The winner will be invited to present his contribution before the Fourteenth Annual Meeting of the Mississippi Valley Medical Society to be held in St. Louis, September 28, 29, 30, 1949, the Society reserving the exclusive right to first publish the essay in its official publication. All contributions shall be typewritten in English manuscript form, submitted in five copies, not to exceed 5,000 words, and must be received not later than May 1, 1949. Further details may be secured from Harold Swanberg, M.D., Secretary, Mississippi Valley Medical Society, 209-224 W.C.U. Building, Quincy, Illinois.

* * *

The first International Congress on Rheumatic Diseases ever held in the United States will take place at the Waldorf Astoria in New York City, May 30 to June 3, 1949, inclusive. This seventh International Congress is sponsored by the International League against Rheumatism. The host is the American Rheumatism Association in cooperation with the New York Rheumatism Association. Seven (five morning and two afternoon) scientific sessions are planned. Also five one-hour round table conferences on various clinical topics will be held under the leadership of authorities in the respective fields. Short clinics, papers and reports will be given concurrently at four or five New York hospitals during three afternoons.

* * *

The Ciba award for meritorious work in endocrinology will again be offered in 1949. It will be given in recognition of the accomplishment of an investigator, not over 35 years of age, in the field of clinical or preclinical endocrinology. The award is for $1,200, but if within two years of the date of the award the recipient chooses to use it to aid in working in a laboratory other than the one in which he is normally located, the amount will be increased to $1,800. The winner will be announced at the 1949 annual meeting of the Association for the Study of Internal Secretions. A special committee of five members of the Association chooses the recipient of this award, subject to ratification by the council of the Association.

* * *

The American College of Physicians is offering a postgraduate course in gastroenterology in San Francisco, February 7-12. Classes are to be held at the Stanford University School of Medicine and the University of California Medical School. Registration for the course, which will survey recent and significant developments in gastroenterology, will be limited to 100. Further information may be had from E. R. Loveland, executive secretary, American College of Physicians, 4200 Pine Street, Philadelphia 4.

INFORMATION

The Use of Streptomycin In Tuberculosis*

The committee on chemotherapy and antibiotics of the American College of Chest Physicians submits the following report of the use of streptomycin in tuberculosis:

INDICATIONS FOR TREATMENT

Nearly all forms of tuberculosis respond to treatment with streptomycin in some degree. However, the drug should by no means be used indiscriminately.

Pulmonary Tuberculosis: It is extremely difficult to lay down hard and fast rules for the use of streptomycin in pulmonary tuberculosis. Especial care in the selection of cases is necessary. The drug has its greatest usefulness in cases with an appreciable amount of exudative disease. In some other cases streptomycin is responsible for symptomatic improvement and the prevention of complications.

1. Definitive treatment: This category includes chiefly progressive lesions of recent origin with little or no destruction of tissue, such as progressive primary tuberculosis and tuberculosis due to hematogenic and bronchiogenic dissemination.

2. Preparation for surgical procedures, including temporary and permanent collapse and excisional surgery. In some cases pneumothorax can be instituted sooner and with greater safety after a course of streptomycin. Not infrequently the drug is of great value in preparing patients as candidates for thoracoplasty. As prophylaxis, streptomycin should be used routinely in excisional procedures.

It must be emphasized again and again that streptomycin is *not* a substitute for sanatorium care and other proven procedures. Rather it is a valuable adjunct to these other measures.

Extrapulmonary tuberculosis: Streptomycin is the only treatment available in miliary tuberculosis and tuberculous meningitis. In such cases early and intensive treatment is imperative. Streptomycin is the treatment of choice for tuberculous sinuses, tuberculosis of the oropharynx, larynx and tracheobronchial tree, tuberculous enteritis and peritonitis, tuberculous otitis media, and tuberculous pericarditis. In renal tuberculosis, symptomatic improvement is usually prolonged and bacterial conversion occurs in some cases. Tuberculosis of the bones and joints is often improved by streptomycin but chemotherapy is not a substitute for orthopedic surgery when this is indicated.

Streptomycin is valuable as preoperative and postoperative treatment of tuberculosis in operations on the genito-urinary tract, and bones and joints, in pericardiolysis, in incision and drainage of abscesses and fistulectomy.

ADMINISTRATION

Streptomycin is administered by intramuscular or deep subcutaneous injection. The optimal regimen for the administration of streptomycin has not been determined. In most forms of tuberculosis results appear to be satisfactory when a dose of 0.5 to 1 gm. a day is administered in one or two injections for six to eight weeks. With this mode of therapy complications are very infrequent and in most cases their clinical importance may be discounted. In tuberculous meningitis and miliary tuberculosis treatment should be vigorous—a dose as high as 2 gm. per day for four months, or longer if necessary. In tuberculous meningitis results seemingly are better when intramuscular injection is supplemented by intrathecal injection of from 25 to 50 mgm. every 24 to 48 hours for two or three months, or as long as this method of administration is tolerated by the patient.

Since drug fastness is apparently closely related to duration of treatment, regardless of the daily dosage, limitation of the period to a few weeks may be effective in avoiding this phenomenon in many cases.

The physician handling a case of tuberculosis would do well to ask himself the following questions before administering streptomycin:

1. Why is streptomycin being used: for definitive therapy, as preparation for surgery, for prophylaxis, or for relief of distressing symptoms?

2. Is the type of lesion present of such a nature as to warrant the use of streptomycin in addition to other available therapy?

3. Can the purpose of chemotherapy be accomplished within the relatively short period of the drug's effectiveness? (Almost three-fourths of the patients show resistant organisms after three to four months of continuous daily streptomycin treatment.)

OTHER CHEMICAL AND ANTIBIOTIC SUBSTANCES

There is no other substance known today which compares with streptomycin in its effectiveness against tuberculosis. The sulfones, promin and promizole, are generally ineffective alone. Experimental work is in process to determine whether or not there is synergistic action when any of these are added to streptomycin. Para-aminosalicylic acid is promising on the basis of laboratory experimentation but sufficient clinical work has not yet been done to permit evaluation of this drug. Subtilin has not had sufficient clinical trial and there is not yet enough animal experimentation to indicate its usefulness. Of the many other antibiotic substances, none has shown in preliminary experimentation indication of real value against tuberculosis and none has had clinical trial.

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*A report by the Committee on Chemotherapy and Antibiotics of the American College of Chest Physicians.

Submitted for the Committee on the Management and Treatment of Diseases of the Chest by the Sub-Committee on Chemotherapy and Antibiotics.

Committee on Chemotherapy and Antibiotics: Karl H. Pfuetze, M.D., Cannon Falls, Minnesota, chairman; B. L. Freedlander, M.D., San Francisco, California, vice-chairman; Sumner S. Cohen, M.D., Oak Terrace, Minnesota, secretary; Manuel Albertal, M.D., Buenos Aires, Argentina; Arnold Shamaskin, M.D., Hines, Illinois; Henry C. Sweany, M.D., Chicago, Illinois; Carl W. Tempel, Col., M.C., Denver, Colorado; John V. Thompson, M.D., Indianapolis, Indiana.

Committee on the Management and Treatment of Diseases of the Chest: Edwin R. Levine, M.D., Chicago, Illinois, chairman.

Approximately 199,755 Living Physicians In United States

FRANK G. DICKINSON, Ph.D.

Director, Bureau of Medical Economic Research, Chicago

According to a tabulation from the punch cards being developed by the Bureau's staff,† there were 199,755 living physicians in the United States as of about June 1, 1948. Cards have not yet been punched for June graduates of medical colleges. All living physicians for whom cards have been prepared are included in this tabulation by states. It is known that some of them are retired, some are not in practice and some are employed by federal, state and local health agencies. As the Bureau's punch card system nears completion subsequent tabulations will present breakdowns showing the number in each of these groups.

The Bureau started on this operation more than a year ago and hopes to have all the punch cards complete early in 1949. As all information recorded to date in our punch cards has been taken from the records of the Directory Department, our work cannot move along any faster than the vast clerical operation of the Directory Department in preparing its final copy for the new American Medical Directory. When finally completed our punch cards will contain some information which will not appear in the Directory and vice versa.

We present the accompanying table for publication at this time because comparable data on the number of physicians in each of the states have not been published since the 1942 Directory. This table is offered at the present time as an aid to those who have need for over-all data on the number of living physicians in the several states. Owing to unrecorded deaths and interstate migrations in addition to some inevitable duplication and omissions of punch cards prior to a final check, there are a number of small errors of unknown magnitude in this list which will be removed before the punch card system is completed. As additional tabulations and breakdowns will be published as soon as we complete them, we trust that interested readers will postpone any requests for additional data.

At this stage of our operations, one important statistical fact emerges. The (approximate) number of living physicians in the United States is now 17 per cent greater than the 170,163 shown in the 1940 A.M.A. Directory; the population of the United States has increased only 12 per cent since 1940. Because the number in each state as shown in this table is only approximately correct we are not ready to present the increase or decrease in the number of living physicians in each state. This is another way of saying that the total for the United States, 199,755, is a more reliable estimate than the number shown for any one state.

APPROXIMATE NUMBER OF LIVING PHYSICIANS IN THE UNITED STATES, BY STATES, MAY-JUNE, 1948

State	No. Living	State	No. Living
Alabama	2,238	Nebraska	1,625
Arizona	802	Nevada	198
Arkansas	1,750	New Hampshire	727
California	16,069	New Jersey	6,585
Colorado	2,202	New Mexico	506
Connecticut	3,261	New York	30,970
Delaware	439	North Carolina	3,377
District of Columbia	4,130	North Dakota	467
Florida	2,931	Ohio	10,091
Georgia	3,145	Oklahoma	2,266
Idaho	470	Oregon	1,852
Illinois	13,307	Pennsylvania	14,633
Indiana	4,396	Rhode Island	1,039
Iowa	2,933	South Carolina	1,550
Kansas	2,223	South Dakota	517
Kentucky	2,683	Tennessee	3,549
Louisiana	3,080	Texas	7,621
Maine	1,010	Utah	831
Maryland	3,696	Vermont	589
Massachusetts	9,102	Virginia	3,306
Michigan	7,127	Washington	2,814
Minnesota	4,263	West Virginia	1,839
Mississippi	1,525	Wisconsin	3,873
Missouri	5,352	Wyoming	252
Montana	544		
Total			199,755

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†The punch cards have the same geographic coverage as the American Medical Directory. The approximate number of living physicians in Canada about June 1, 1948, was 14,015; Alberta 792, British Columbia 1,181, Manitoba 780, New Brunswick 326, Nova Scotia 587, Ontario 5,649, Prince Edward Island 73, Quebec 4,015, Saskatchewan 607, Yukon 2, and Northwest Territories 3. Labrador had 2 living physicians and Newfoundland 122. There were 1,278 located in United States possessions and territories; 71 in Alaska, 73 in the Canal Zone, 4 in the Mid-Pacific islands of Guam, Johnson, Midway, and Wake; 408 in Hawaii, 648 in Puerto Rico, and 14 in the Virgin Islands. In addition to these there were 1,279 graduates of American and Canadian schools temporarily located in foreign countries.

BOOK REVIEWS

A COURSE IN PRACTICAL THERAPEUTICS. By Martin Emil Rehfuss, M.D., F.A.C.P. Professor of Clinical Medicine and Sutherland M. Prevost, Lecturer in Therapeutics, The Jefferson Medical College, Philadelphia; F. Kenneth Albrecht, M.D., formerly Clinical Director U. S. Marine Hospital, Baltimore, Md.; and Alison Howe Price, A.B., M.D., Asst. Professor of Medicine, The Jefferson Medical College, Philadelphia. The Williams and Wilkins Company, Baltimore, Md., 1948. $15.00.

Every honest reviewer has to admit at times that his first impression of a book turns out to be entirely wrong—an experience which may convert him into an enthusiastic supporter of a work at first glance condemned. Such was the case with this reviewer's opinion of Practical Therapeutics. He was taken aback by the large size. The bulkiness appeared unnecessary for a book entitled "practical." However, this objection was overbalanced by the large print and easy readability. As he continued to investigate the body of the book his opinion became progressively more favorable until he now feels that he can recommend it enthusiastically.

Practical Therapeutics is a summary of the course in therapeutics at the Jefferson Medical College. The information has been gathered by the students year by year as part of their assignments in this course. These contributions have been reviewed and revised by the various members of the faculty teaching in the course and finally have been incorporated in this book. It is divided into four sections. The first is on general therapeutic principles. It includes the plan of a program for therapy for the individual patient, involving the physical and emotional aspects of the disease and of the patient. It has a chapter on prescription writing as well as other chapters on practical pharmaceutics and dietary principles. The second section is devoted to a discussion of symptoms and their management. The third and largest section takes up the individual therapy of various disease conditions. A brief etiological and diagnostic survey of each condition is given before treatment per se is discussed. The fourth section deals with various special subjects which the authors state should be of interest to the practitioner of general medicine but which seem to reflect the primary undergraduate teaching interest of the contributors.

The treatment of each symptom, condition, or disease is set forth in outlined form. Pharmaceutical prescriptions are given in detail, both U.S.P. preparations and proprietary remedies. The therapy is brought entirely up to the date of publication—summer of 1948. Particular mention should be made of the excellent illustrative diagrams by Wm. Toechel. These are often more helpful than several pages of text.

The book is excellent to use as a reference in a doctor's office and will probably be one of the most frequently consulted of any volume in his armamentarium. Whatever disagreement one may have with the individual opinions of the thirteen authors, one must conclude that the entire book is clear and logically planned and outlined. The inclusion and the occasional emphasis on proprietary drugs when U.S.P. preparations are available is of debatable merit but perhaps may be defended as part of current medical drug therapy (which is all too muchly guided by the sales representatives of the pharmaceutical houses)!

* * *

MODERN DRUGS IN GENERAL PRACTICE. By Ethel Browning, M.D., Ch.B., Second Edition. The Williams & Wilkins Company, Baltimore, 1947. $4.00.

This book by an English pharmacologist is designed to bring the busy practitioner up to date with a minimum of reading and succeeds unusually well. The opening chapter, devoted to definitions and generalities, is similar to the first few pages of many other treatises on pharmacology and therapeutics and might well have been omitted from a book of this type, except for one remarkable statement which, if true, is not a generally known truth, namely that there is a "curious liability of sufferers from rheumatic affections to develop one of the most severe effects of sulfonamide toxicity—agranulocytosis."

Chapter II devotes nine pages to penicillin; the discussion is clear and adequate concerning essential chemical properties, mode of action, methods of administration in detail, and clinical indications with dose for each indication. The dose mentioned for subacute streptococcus viridans endocarditis would be considered too small by American cardiologists. An additional two pages gives a bibliography of 42 titles. Chapter III on The Sulfonamides consists of 24 pages; in addition to the general description of pharmacology and uses of the various compounds, there are important statistical comparisons. For example, the statement is made that the mortality from cerebrospinal fever treated with sulfamerazine is 6.7 per cent in contrast to 12.5 per cent for sulfadiazine.

Mortality figures for pneumonia cases treated with sulfonamides are much lower than figures from American hospitals.

Other well written chapters are the ones on digitalis, diuretics, adrenergic and cholinergic drugs, the barbiturates, the local anesthetics and the anthelmintics. Not so informative are the chapters on gold compounds, opium derivatives, gastro-intestinal drugs, local antiseptics and antithyroid substances.

The book is recommended for all practitioners and students of medicine.

* * *

METHODS IN MEDICAL RESEARCH, Volume I, Van R. Potter, Editor-In-Chief. The Year Book Publishers, Inc., Chicago, Ill. 1948. $8.00.

This fascinating volume presents detailed descriptions and discussions of methods used in medical research in four separate fields. The section on cellular respiration devotes 83 pages to respiration in tissue slices, the homogenate technique, analyses for tissue metabolites and an apparatus for respirometry in small intact animals. This material should appeal to workers in physiology laboratories. Gastroenterologic research methods include those involving choleresis, preparation and use of the Mann-Williamson dog (for study of peptic ulcer), and gastric acidity. This section occupies only 20 pages. The assay of antibiotics (65 pages) appears to be adequately explored.

The fourth and largest (188 pages) section deals with the circulation, particularly with measurements of blood flow. Its broad scope includes consideration of recorders of venous drainage and mean flow, pulsatile flow meters, perfusion systems, regional blood flow, collateral circulation, cardiac output and contractility, and analysis of cardiovascular activity. Clinical and pre-clinical investigators will be attracted especially by the material on plethysmography, the roentgen electrokymograph, right heart catheterization, and measurement of renal, hepatic and cerebral blood flow.

Each subdivision is written by an appropriate expert, sometimes subjected to review by another expert, and often commented upon by a third. The volume is rich in detail, even to specifying from what manufacturer a given item may be obtained for the construction of apparatus. A bibliography follows each subdivision, and the entire book is indexed for subject and author.

The editors are to be congratulated upon this venture. They promise similar annual volumes, each to contain sections representing methods used in biochemistry, physiology and pharmacology, microbiology and immunology, and biophysics. Clinical scientists should add the present volume to their libraries, and physicians in general might well open its covers for a look at the techniques which are more and more being applied to the investigation of their patients.

* * *

BACTERIAL AND VIRUS DISEASES—Antisera, Toxoids, Vaccines and Tuberculins in Prophylaxis and Treatment. By H. J. Parish, M.D., F.R.C.P.E., D.P.H., Clinical Research Director, Wellcome Foundation Ltd. The Williams and Wilkins Company, Baltimore, Maryland, 1948. $2.75.

This little book is a catalogue of biological materials that are available in the British Isles for the treatment and prevention of infectious disease. One section is devoted to the consideration of therapeutic antisera and another to prophylactic agents. The preparation and proper technique for administration of each is very briefly described. A reasonably critical selection of these agents has been made and all of those included are well established in clinical medicine.

The author unfortunately has not presented any information which permits a rational selection of the various materials in the prevention or treatment of disease and his statements of the techniques of administration are not sufficiently detailed. The physician would frequently need to consult a more complete work to determine the proper application of these biologics.

* * *

ORAL VACCINES AND IMMUNIZATION BY OTHER UNUSUAL ROUTES. By David Thomson, O.B.E., M.B., Director of the Pickett-Thomson Research Laboratory; Robert Thomson, M.B., Ch.B., Pathologist, St. Paul's Hospital, London. Assisted by James Todd Morrison, M.D. (Aberdeen), The Williams and Wilkins Company, Baltimore, 1948. $11.00.

This book is another of those extraordinary compendia of the medical literature which have been assembled from time to time by the Thomsons and published under the auspices of the Pickett-Thomson Research Laboratory. Several previous volumes, the last of which is believed by the reviewer to have appeared in 1932, dealt with the whole of streptococcus infection and the relationship of these organisms to a variety of clinical conditions. These works are a storehouse of information and present summaries of all of the earlier investigations in these special fields of interest.

The present volume treats the subject of immunization against infectious disease by the administration of oral vaccines in a similar manner. The entire medical literature dealing with this subject has been summarized under various headings. The first considers the rationale of oral vaccination. The second and third describe in detail the results of experimental and field trials of immunization of human beings against typhoid fever, bacillary dysentery, tuberculosis, diphtheria, colds and influenza, gonococcal disease, intestinal infections, scarlet fever, tetanus and a miscellany of other less well studied disorders.

A fourth section deals with immunization by unusual routes including the respiratory tract, the skin and even the gingivae by the incorporation of vaccines in tooth paste.

The authors' conclusions are, for the most part, conservative and in accord with what might be regarded as the average published experience. They have unfortunately chosen to consider a subject of the greatest complexity and one in which controlled definitive experiments in human beings may be established rarely and only with great difficulty. The problems involved are emphasized when it is recognized that the most elaborate studies over a period of years have failed to substantiate fully the prophylactic value of parenteral immunization against any of the mentioned infections except for typhoid fever, diphtheria, tetanus and possibly tuberculosis.

The evidence presented by the Thomsons supporting the value of immunization against tuberculosis by the ingestion of living BCG is stimulating and deserves inspection by workers in this field. The authors have probably overstated the usefulness of oral typhoid vaccine. Their rather strong arguments indicating that various respiratory infections, particularly the common cold, may be prevented by feeding large numbers of killed respiratory pathogens such as pneumococci and hemolytic streptococci are not in accord with a number of carefully controlled studies in this country. It is almost certain that these preparations are useless.

In conclusion and in retrospect, it seems unfortunate that the great talent that these authors have repeatedly demonstrated in the collection and summarization of the medical literature could not have been directed into one of the many fields in which comprehensive reviews would constitute investigative tools of the first magnitude.

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TEXTBOOK OF CHIROPODY. By Margaret J. McKenzie Swanson, B.Litt., F.Ch.S., Cofounder of Edinburgh Foot Clinic and School of Chiropody. With 168 Illustrations. The Williams and Wilkins Company, Baltimore, Md., 1948.

This book is written for students of chiropody. It contains some useful information which would be helpful to physicians caring for minor foot diseases such as corns, but it is lacking of much useful information about the treatment of such a common disability as flat feet. Strapping, manipulative procedures, and the local application of drugs are stressed in many problems which would yield quickly to modern chemotherapy or surgical procedures. Wisely the author frequently warns the chiropodist throughout the book to send the patient to a doctor if response to his treatment is not prompt.

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OUTLINE OF PHYSIOLOGY. By William R. Amberson, Ph.D., Professor of Physiology, University of Maryland and Dietrich C. Smith, Ph.D., Associate Professor of Physiology, University of Maryland. Illustrations by the Late Norris Jones, Instructor in Scientific Illustrating, Swarthmore College and William Loechel. Second Edition. The Williams & Wilkins Company, Baltimore, 1948. $5.00.

This "Outline" is in no sense a textbook of physiology for medical students, nor, as the title might suggest, would it provide the medical man preparing for a Board examination a means of acquiring an adequate dose of physiology in tasteless capsules to be absorbed as quickly and painlessly as possible. Rather it is a highly individual presentation from the biological viewpoint of the authors' concept of the philosophy and content of modern physiology. To an extent unparalleled in similar works it incorporates the historical development of the science into the account of physiological mechanisms. Outstanding contributions, from the observations of Aristotle on the electric fishes to those of the last decade, are described in a refreshingly intimate manner, including generous quotations from the originals and portraits of the men themselves. Among recent advances thus described may be mentioned the study of the protein chains in muscle as revealed by x-ray diffraction methods, the revolution in our concepts of capillary flow resulting from the work of Chambers and Zweifach, the mapping of the respiratory centers by the Ranson group, Wolff's studies of human gastric secretion, Pitt's studies of the mechanism of the renal excretion of acid and Long's investigation of the adrenal reaction to stressful situations. The treatment of most topics is thoroughly up-to-date. However, there are marked discrepancies in the adequacy of treatment of various topics: that on the central nervous system is one of the best available anywhere for a beginner, while those on metabolism, temperature regulation and the autonomic nervous system are trite and poverty-stricken. There are a number of serious misstatements of fact. The earlier chapters are devoted to an elementary presentation of various physicochemical topics in such a manner as to suggest that they are building blocks on which the subsequent consideration of physiological mechanisms will rest. Like almost all other attempts at making physiology a deductive science, this approach is a failure, little use of these building blocks being made when the function of the various body systems is presented. The book is well illustrated with original line drawings which are unusually successful in clarifying the text. It is very well printed and bound. The medical man who has the time and inclination for a leisurely exploration of what academic physiologists have accomplished since he studied the subject should find pleasure in the perusal of this unusual book.

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THE ALCOHOLIC WOMAN, CASE STUDIES IN THE PSYCHODYNAMICS OF ALCOHOLISM. By Benjamin Karpman, M.D., Chief Psychotherapist, St. Elizabeths Hospital, Washington, D. C. Sponsored by the Washington Institute of Medicine Research Foundation. The Linacre Press, Washington 6, D. C., 1948. $3.75.

This book of 241 pages relates the case histories of three women who, among other types of aberrant behavior, drank alcohol to excess. They would have been readily classified by the old-fashioned psychiatrist as constitutional psychopaths. The author, however, states in the preface that the "material is oriented in the psychoanalytic focus," a statement that is amply borne out by the fact that a majority of the volume is devoted to a graphic, detailed account of the sexual activities of these women. To one who is unfamiliar with the tenor of psychoanalytical literature this may even be rather shocking. However, in such company the author would sit rather to the right of center. Actually, it is doubtful if a study of this book would contribute much to the average practitioner's understanding of alcoholism in women, even though some amusement might be derived from it. By all means, it should be kept where the children cannot get at it.

* * *

A.N.A.—PUBLIC RELATIONS WORKSHOP.

This is entitled A Manual of Practical Public Relations Techniques for the Guidance of the National Membership of the American Nurses' Association, and is published by the Association in New York. It is a 32-page manual with 39 illustrations and it was prepared by the publicity agent employed by the American Nurses' Association for distribution to nurses and nursing organizations. Its purpose apparently is to organize further and strengthen the central nursing bodies. To accomplish this, advice and instruction are given in all forms of propaganda to the press, radio, movies, television, mail, talks, local organizations, and the techniques are given in detail.

The manual is carefully considered and prepared and is well adapted to its purposes. In general it could serve as a guide to any group or union for purposes of propaganda. It provides insight into the interests and the activities of those in control of nursing bodies. It seems likely that such a manual is designed to implement the views and aims expressed in the more recent nursing publications, viz. "Nursing for the Future" by Esther Lucile Brown and "Nursing in Modern Society" by Mary Ella Chayer, which are aimed at the establishment of the nursing profession as an autonomous body with social functions and legal authority, independent of the medical profession and not primarily concerned with bedside nursing.

It is regrettable that the interests of these central nursing bodies cannot be directed to solving the nursing needs of the public and the individual sick and less time and money spent on the means of strengthening themselves and endeavoring to take over social functions not in their province.

This manual is well worth studying by any person or bodies interested in methods of organization and publicity.

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A-B-C'S OF SULFONAMIDE AND ANTIBIOTIC THERAPY. By Perrin H. Long, M.D., F.R.C.P., Professor of Preventive Medicine, Johns Hopkins University School of Medicine; Physician, The Johns Hopkins Hospital. 231 pages. W. B. Saunders Company, Philadelphia, Pa., 1948. $3.50.

The author is one of the pioneers in the study of antibacterial chemotherapy in the United States and is a recognized authority in this field. This background has not prevented him from producing a most unsatisfactory book. A brief general introduction includes arbitrary schedules for the administration of sulfonamides and penicillin which are satisfactory. Penicillin in oil and beeswax is a suggested repository dosage form. It should be noted that this preparation has been entirely replaced by procaine penicillin in oil or aqueous suspension.

The various clinical disorders are listed alphabetically by the common medical name so that the treatment of abscess, acne, actinomycosis, agranulocytosis, amebiasis, angina and anthrax follow sequentially. Little emphasis is placed on a correlation of disease by etiological agent, and the text is obviously directed at the busy practitioner who will only occasionally consult the bacteriological laboratory or a more complete work for detailed advice as to treatment. The descriptions of the various clinical conditions are, on the average, about 300 words in length. A discussion of etiology, specific and auxiliary therapy is included in this brief space.

The chemotherapeutic agent of choice in pneumococcus pneumonia and most types of hemolytic streptococcus infection, including scarlet fever and sore throat, is stated to be a sulfonamide. This curious point of view has been previously expressed by the author. It is difficult to justfy the exposure of any patient to the hazards of sulfonamide intoxication when his disease may be well controlled by four or five daily injections of repository penicillin.

This book cannot be recommended to the student or practitioner of medicine.

* * *

GENERAL ENDOCRINOLOGY. By C. Donnell Turner, Ph.D. Associate Professor of Zoology, Northwestern University. First edition, 604 pages with 164 figures. W. B. Saunders Company, Philadelphia, 1948. $6.75.

The author, who is associate professor of zoology at Northwestern University, has designed this textbook in order to present the subject of endocrinology as a fundamental aspect of biologic science, rather than as a medical specialty. As stated in his preface: "The subject matter is approached from an experimental rather than a clinical point of view. The characterization and treatment of clinical endocrinopathies are not emphasized, since these are regarded as properly the function of medical schools. Attention is directed to the operation of coordinating mechanisms in plants, invertebrates and vertebrates."

The book fulfills these stated aims in admirable fashion and since it is the first of its kind should be welcomed by teachers of advanced courses in the biological sciences. To an undergraduate student the volume might be quite formidable, for it is written in the style of a "complete review of the literature," with statements of facts fully annotated to extensive bibliographies. That it is a "difficult" book may rest in the fact that the author has defined a hormone in such a broad sense that there are hardly any limits to the material discussed. This introduces an element of confusion into the first chapter on the Biology of Secretion. Several pages are devoted, for example, to the elaboration of renin (an enzyme) by the ischemic kidney and to the factors described by Valy Menkin as playing a role in inflammation. With his broad definition, even nicotinic and ascorbic acids should be included as hormones in species other than primates and guinea pigs. From a teaching standpoint at least, enzymes and vitamins might better be excluded from discussion.

Especially noteworthy are the chapters on the Biology of Sex and Reproduction, the Hormones in Pregnancy and Lactation, and on the Pituitary Gland. The physician interested in endocrinology would do well to absorb such fundamental facts as they apply to many species before limiting himself to man. Even the chapter on the Endocrine Mechanisms in the Invertebrates was fascinating to this reviewer—though difficult for him to understand—for it explains why caterpillars turn to butterflies, as well as growth, differentiation and sex terms of the "bees and the flowers."

The biochemistry of the hormones is well integrated with discussions of their physiology. Unfamiliarity with clinical endocrinology on the other hand leads to minor errors, such as the "sedative effect of progesterone upon the endometrium," or the omission of Cushing's syndrome while giving full discussion to Addison's disease and the adrenogenital syndrome. Basically, however, the book shows scholarly workmanship and should be a welcome addition to any scientist's library.

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TWENTIETH CENTURY SPEECH AND VOICE CORRECTION. Edited by Emil Froeschels, M.D., President, International Society for Legopedics and Phoniatrics; President, New York Society for Speech and Voice Therapy. Philosophical Library, New York, 1948.

The purpose of this book is to stimulate interest in speech and voice correction. It tries to approach the speech teacher as well as the physician and the psychologist. Froeschels, former professor of speech pathology in Vienna, later of the Central Institute for the Deaf, Washington University, St. Louis, is the editor of these contributions which cover hearing, speaking, singing, reading problems as well as functional therapy of aphasia, cleft palate and voice training after laryngectomy. The variety of authors and their divergent opinions make this book somewhat confusing.

The speech specialist will be amused by the ambitious title "Twentieth Century Speech and Voice Correction" written in 1948 although this book contains only some of the basic ideas and omits the leading theories on neurosis because the editor does not happen to agree with them. Most of the illustrations are antiquated. In spite of a certain one-sidedness of theories and therapeutical procedures laryngologists, pediatricians, and psychiatrists will find many chapters of interest.

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BRONCHIOGENIC CARCINOMA AND ADENOMA, with a CHAPTER ON MEDIASTINAL TUMORS. By B. M. Fried, M.D., Associate Attending Physician, Montefiore Hospital for Chronic Diseases, New York, N. Y. The Williams and Wilkins Co., Baltimore, Md., 1948. $6.00.

In recent years increasing attention has been devoted to bronchiogenic carcinoma. This added interest in the disease known for many centuries comes about because of many factors. The frequency with which carcinoma of the lung has been reported as the cause of death has aroused speculation as to whether there is an absolute as well as a relative increase in the incidence of the disease. It has been predicted that in time carcinoma of the lung would become the most common malignancy in the male sex.

The author of this excellent book lists his experience based on large clinical and postmortem material. Sections on the histogenesis and on the classification of bronchiogenic carcinoma are particularly noteworthy. The author illustrates his chapters on clinical manifestations with briefly reported case histories. There are 47 of these case histories reviewed, forming one of the most distinctive teaching values of this volume.

Treatment both by radiation and operation is very briefly reviewed. However, sufficient references are made to outstanding contributions in these fields to enable the reader to readily pursue further study in this direction.

At the time of the writing of the chapter on laboratory methods of diagnosis the cytological examination of the sputum or bronchial secretions had not been fully reported in the literature. As a result the author's statistics in this field are not the accepted ones of today. It has been shown that results obtained by the cytological examination of the sputum for carcinoma are efficacious or better than those reported on examination of secretions obtained at bronchoscopy.

Brief but very well balanced chapters on bronchiogenic adenoma, bronchiogenic mesodermal tumors and tumors of the mediastinum are reported.

This book is easily readable and very well illustrated. It has been written so that medical students, general practitioners and specialists will find excellent material readily available. This book can be recommended for the practical working and reference library of all physicians.

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MANUAL FOR MEDICAL RECORD LIBRARIANS. By Edna K. Huffman, R.R.L., Director, Program in Medical Records Library Science, Northwestern University, Chicago, 2nd Edition, 371 pages. Physicians' Record Company, Chicago, Illinois, 1948. $4.50.

Manual for Medical Record Librarians (revised edition), by Edna K. Huffman, is a text and reference book which should have a prominent place on the book shelf of every record department in every hospital desirous of maintaining a medical record department which meets the requirements of the point-rating system of the American College of Surgeons and the American Medical Association. It encompasses every phase of medical record library science. Trustees, administrators and department heads will be interested in its authoritative text. It should be of special value to the record librarian as a guide in organizing and managing the department in order to give the utmost service to the hospital and in helping to raise the standards of medical records. As a textbook for the student it is unsurpassed.

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GARDINER'S HANDBOOK OF SKIN DISEASES. Revised by John Kinnear, M.D., Lecturer in Diseases of the Skin, St. Andrews University, Physician for Diseases of the Skin, Dundee Royal Infirmary. Fifth Edition with twenty colored plates, nine from Dufaycolor Photographs. The Williams and Wilkins Company, 1948. $4.50.

This fifth edition is a compact volume of 250 pages, well illustrated by colored and black-and-white pictures of clinical conditions and by diagrammatic illustrations of the important histological changes. The various skin disorders are discussed in brief paragraphs but a surprisingly large amount of essential information is given and the latest therapeutic approaches are offered. The more common conditions such as the various types of injections are discussed at more length. Details of many procedures including the modern treatment of syphilis are not given. Leprosy, the deep mycoses such actinomycosis, etc., and such an important condition as melanoma are not mentioned.

As a "handbook" this volume can be recommended with the realization that it is by no means a complete treatise on the subject of Dermatology.

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Hodgkin's Disease

A Clinical-Pathological Review of 150 Cases

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SUMMARY

One hundred and fifty cases of Hodgkin's disease were analyzed in an effort to detect significant clinical-pathological correlations and to elucidate any possible factors of prognostic or etiological importance.

A relatively long survival for patients with Hodgkin's paragranuloma was not noted in this series. Instead the survival rate among them was closely parallel to that of patients with classical granuloma. Hodgkin's sarcoma is a more malignant disease with a patient survival rate not more than half that of patients with the granuloma variety. It is not necessarily a disease of older age groups. Great caution must be exercised to avoid including non-Hodgkin's disease tumors under the heading of Hodgkin's sarcoma or paragranuloma.

The series reported corresponds with many other reported series of Hodgkin's disease as regards greater incidence in males and longer survival in females. In this series the cases in patients under the age of 15 were all in males. The predominance of initial enlargement of the cervical nodes was again noted in this series, as was the high proportion of negative reaction to tuberculin tests. The incidence of tuberculous lesions in patients who died of Hodgkin's disease was only slightly greater than in those who died of other lymphoma. Site of origin of the disease apparently affects survival time. There was statistical evidence that gonadal activity might influence the equilibrium of the disease.

Lymph node bacteriological cultures were not remarkable. Brucella organisms were absent. Fertile egg passages for detecting possible viral agents revealed increased egg mortality and cutaneous sensitivity reactions to the harvested amniotic fluid.

IN THE last 25 years there have been studied at the University of California Hospital 150 cases of microscopically proven Hodgkin's disease. From this group, biopsy slides are available from 123, and 33 complete autopsy examinations have been done. This material is being critically reviewed with the object of comparing its characteristics with other reported series of Hodgkin's disease cases, of elucidating certain details of histologic-clinical correlation, and of searching for any factors of possible prognostic or etiologic import. In a subsequent paper[3] the finer details of the microscopic characteristics of this same material will be presented.

HISTOLOGIC CLASSIFICATION

For the diagnosis of classical Hodgkin's disease the presence of Sternberg-Reed giant cells, fibrosis, abnormal lymph node pattern and eosinophils is required. From this prototype, two variants have been gradually defined, one possessing superficially many of the characteristics of a small cell lymphosarcoma, and the other possessing many character-

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istics of a bizarre reticuloendothelial sarcoma. The classical type of Hodgkin's disease has been quite uniformly referred to as Hodgkin's granuloma, and the bizarre cellular and malignant-looking reticuloendothelial variant as Hodgkin's sarcoma (Hodgkin's lymphoreticuloma, Bersack[2]). That variant presenting the resemblance to lymphocytic lymphosarcoma has been called Hodgkin's lymphoma, Bersack[2]; atypical Hodgkin's, Warthin[23]; "early Hodgkin's disease"; or, more recently, paragranuloma, Jackson and Parker.[11]

Pre-Hodgkin's disease changes in lymph nodes have been described, consisting of reticuloendothelial hyperplasia and distortion of the lymph node pattern. However, these are by no means specific, and their significance is doubtful. In fact, a positive diagnosis of Hodgkin's disease cannot be made in the absence of Sternberg-Reed cells. In their absence, to be pleased with having correctly guessed the subsequent development of a Hodgkin's disease process is to ignore the many times that the diagnosis of Hodgkin's disease without Sternberg-Reed cells will have been an error. In the slides examined for this report, no characteristic "pre-Hodgkin's disease" changes could be identified in lymph nodes immediately adjacent to nodes frankly involved with Hodgkin's disease, nor in uninvolved portions of a partially diseased lymph node.

Although the microscopic separation of Hodgkin's disease into paragranuloma, granuloma and sarcoma varieties is justified and well established in the literature, it is not possible, after reviewing the material in this paper, to entirely support the statement by Jackson and Parker[11] that "It should become clear . . . that any description [of Hodgkin's disease] that includes all three [variants] as a single form of the disease must, of necessity, be inaccurate and of little practical value."

In the first place, statistically drawn conclusions regarding data from the two marginal variants (paragranuloma and sarcoma) of Hodgkin's disease must be made with great care. The very fact that they are variants of a classical type infers that they likewise merge imperceptibly with structurally similar tumors that are not Hodgkin's disease. It is this very merging of structural types that has led so many workers to feel that Hodgkin's disease is not an entity, but instead is a variety of lymphosarcoma, and of similar etiological background. It follows that in collecting examples of Hodgkin's paragranuloma and Hodgkin's sarcoma, certain errors are bound to creep in which will contaminate statistical analyses. It is quite possible that the only Hodgkin's lymphomas and Hodgkin's sarcomas that are completely beyond suspicion are those examples which have passed through or developed into a proven Hodgkin's granuloma stage.

This error in classification is most likely to be made in the case of Hodgkin's sarcoma, because of the tendency to place in that category many poorly defined pleomorphic and large-celled reticuloendothelial sarcomatous tumors. Such being the case, it is likely that any reported series of so-called Hodgkin's sarcoma will be somewhat contaminated with non-Hodgkin's disease cases, and thus tend more nearly to approach the usual sex ratios and age incidence of lymphosarcomas in general.

Hodgkin's paragranuloma variant may rather closely resemble a malignant lymphocytoma. In any series of Hodgkin's paragranuloma, it is likely that some will actually be malignant lymphocytoma, and not Hodgkin's paragranuloma. Some may maintain that the presence of Sternberg-Reed cells proves the diagnosis. That is almost correct. Unfortunately, however, these cells are only peculiar types of reticuloendothelial cells, which, although highly characteristic, do present variations, and are not absolutely pathognomonic. This thus permits certain individual interpretations as to their presence or absence.

Of the 11 cases in this series in which the patients showed the longest survival (5 to 14 years), in only one did biopsy reveal the characteristics of the paragranuloma variant—and in that case the patient survived only five years. In nine of these cases the specimen showed the classical Hodgkin's granuloma pattern, and in one (with the patient having a five and one-half year survival) the lesion commenced as a giant follicular lymphoma tumor. These data do not support the thesis of a relatively prolonged course of the disease with the Hodgkin's paragranuloma variant, although admittedly the number of patients studied is too small to be statistically conclusive.

An analysis of the seven cases diagnosed at the time of the original biopsy as Hodgkin's sarcoma reveals that the mean survival time was eight months from the onset of the disease. This more rapid course for Hodgkin's sarcoma has been frequently noted. The average age of patients in this group of cases is 27 years, and five of them were males.

AGE AND SEX INCIDENCE

Hodgkin's disease may occur at any age. The youngest patient of record was autopsied at four and one-half months of age, and was presumably born with the disease. The case was described by Priesel and Winkelbauer,[17] who state that one month before the infant's birth, a lymph node removed from the mother was diagnosed as a lesion of Hodgkin's disease. The mother died but autopsy was not done.

In this reported series, the greatest age at the time of onset was 73 years and the least was seven years. The age distribution data (Table 1) compares favorably with those reported in the literature (Wallhauser,[22] Baker[1]), and the tendency for the onset before the age of 40 was evident.

The ratio of males to females, 2.4:1, was similar to that found throughout the literature. Below the age of 15 there were 13 cases, all in boys. This very great predominance of males in this age group has been noted by Goldman[10] and Smith,[19] and to a lesser extent by Jackson and Parker.[11]

Table 1.—*Age of Patients at Onset of Hodgkin's Disease*

Age in Years	*Males**	*Females†*	*Total*
1-10	7	0	7
11-20	10	3	13
21-30	31	13	44
31-40	20	10	30
41-50	20	6	26
51-60	11	10	21
61-70	5	2	7
Over 70	2	0	2
Total	106	44	150

*Youngest, 7; oldest, 73.
†Youngest, 15; oldest, 65.

CLINICAL CHARACTERISTICS

The average patient noted on his first entry between two and three signs and symptoms; 4.5 per cent had only one, 25 per cent noted two, and 44 per cent indicated three complaints. As shown in Table 2, malaise was most frequently referred to (17 per cent). Cough was next (10 per cent), then night sweats, weight loss and dyspnea (7 per cent each) were noted. Following the incidence of fever (6 per cent), abdominal pain, back pain, neck, arm or shoulder pain and locally enlarged nodes were each noted by approximately 5 per cent of the patients. In six cases (2 per cent) the disease was diagnosed before any signs or symptoms were noted by the patient (see Table 2).

The location of the originally noted tumors (Table 3) was much as that reported by other observers (Baker,[1] Slaughter and Craver,[18] Smith[19]), with the most frequent sites of apparent origin being in the neck. There is nothing in these data which supports Symmer's[20] statement that the deep nodes are probably ten times more commonly affected than the superficial nodes. Although, as in other series, the left cervical nodes were clearly the site of most frequent origin, there was little else to support the occasionally suggested explanation that the greater incidence of left neck tumors is related to the emptying of the thoracic duct on that side, and hence may represent a spread of the disease from some internal site via that duct to the neck. One point against the theory that the frequency of cervical node involvement by Hodgkin's disease may be explained by a nasopharyngeal "portal of entry," is the rarity of tonsillar and pharyngeal Hodgkin's disease.

TUBERCULOUS, SEROLOGICAL AND OCCUPATIONAL HISTORIES

In 121 patients with Hodgkin's disease a family history of tuberculosis was obtained in 15 per cent. In California the figure for similar data in the normal population is 0.5 per cent (Telford and Gartin-White[21]). In spite of repeated attempts to connect Hodgkin's disease etiologically with some form of tuberculosis, all efforts have failed and there remain but two interesting correlations. One is the often chronic inflammatory granulomatous appearance of the lesions of Hodgkin's disease, and the second is the consistently high percentage of negative tuberculin reactions in patients having Hodgkin's disease. Parker and Jackson[15] reported the greater frequency of healed and active tuberculosis in autopsies on patients with Hodgkin's disease (33 per cent) than in those having other lymphoma (5.3 per cent), cancer (14.6 per cent), or in general autopsies (19.3 per cent). Others also have noted this phenomenon. Baker,[7] however, felt that this increased incidence was questionable and in any case was overemphasized.

In the series of Hodgkin's disease, here reported, the incidence of healed and active tuberculosis was 17 per cent. In an equivalent general autopsy group the percentage of tuberculous lesions (healed and active) was 11 per cent, in the cancer group 4 per cent and in the lymphoma (excluding Hodgkin's disease) group 13 per cent. The tuberculin test was done in 34 cases, with negative reaction in 31 and positive in three. Nobécourt[13] noted this and suggested that this tuberculin anergy might be the explanation of the increased incidence of tuberculosis in Hodgkin's disease. A low incidence of positive reactions to tuberculin tests also may occur with other diseases of the reticuloendothelial system (such as leukemias and lymphosarcoma) which may be caused by that system being "blocked out," with resultant anergy (Parker, Jackson, Fitzhugh and Spies[14]).

Various serological procedures on patients with Hodgkin's disease were performed. The Kolmer test was positive in 5 per cent of 100 cases. In all of 15 cases in which tests were carried out, Brucella and tularemia agglutinations were negative. Typhoid

Table 2.—*Initial Signs and Symptoms as Noted by 135 Patients**

Malaise	17%	No symptoms	2%
Cough	10%	Leg swelling	2%
Night Sweats	7%	Leg pain	1%
Weight loss	7%	Paralysis	1%
Dyspnea	7%	Choking	1%
Fever	6%	"Flu"	1%
Neck, arm and/or shoulder pain	5%	Diarrhea	1%
Back pain	5%	Jaundice	1%
Abdominal pain	5%	Pigmentation	1%
Enlarged nodes	4%	Hoarseness	1%
Pruritus	4%	Dyspepsia	1%
Chest pain	4%	Abdominal mass	0.3%
Anorexia	3%	Hemorrhagic tendencies	0.3%
Rash	3%	Ascites	0.3%

*Patients each noted an average of three symptoms.

Table 3.—*Site of Primary Tumor, Correlated with Survival Time (132 Cases)*

Location		*Percentage*	*Average Survival*
Neck		78%	42 months
Left	43%		
Right	32%		
Unspecified	21%		
Midline	1%		
Axilla		9%	30 months
Inguen		6%	43 months
Chest and abdomen		7%	30 months

and paratyphoid agglutinations in this group revealed increased titres for each of them in two instances. The cell-free filtrates of some Hodgkin's disease lymph nodes were serially passed in embryonated chicken eggs. Not only was an increased mortality demonstrated in these eggs (Bostick[4]), but increased cutaneous sensitivity reaction to their amniotic fluid is now apparent and is being studied further. This is all supportive evidence for the presence of a possible virus agent.

The histories of 126 patients were checked for exposure to animals, the object being to detect any correlations that might indicate the possibility of direct infection from animals. Special attention was directed toward contact with chickens. Seventy-five per cent were city dwellers and essentially free from animal contact. Seven per cent lived in rural communities and had had some slight contact with domestic animals. Eighteen per cent lived on farms with direct care of and exposure to animals. Two patients worked on a poultry farm. The proportion of farm dwellers among patients with Hodgkin's disease is no higher than it is in the general clinic population, and the number massively exposed to fowl is too small to warrant comment.

HODGKIN'S DISEASE AND GONADAL ACTIVITY

Gemmell[9] reported the case of a patient with Hodgkin's disease who developed it during her second pregnancy and had exacerbations during each subsequent pregnancy (two of them) and remissions between pregnancies (with the aid of treatment). He reviewed 57 cases of Hodgkin's disease in females, and concluded that in 46 per cent the onset of the disease was during a period of physiological amenorrhea (puberty, pregnancy, menopause, lactation). He proposed that cyclic ovarian activity is antagonistic to Hodgkin's disease and suggested that, where feasible, pregnancy should be terminated in women having Hodgkin's disease. Levrat and Jarricot[12] noted increase in symptoms during pregnancy in two women with Hodgkin's disease.

In the 35 females with Hodgkin's disease studied in the series here reported, 19 were having normal menstrual cycles at the first hospital entry after the onset of the disease. Eleven were menopausal and five were amenorrheic, making a total of 16 (46 per cent) in a non-cyclic ovarian phase. No cases of Hodgkin's disease occurred before the age of puberty (aet. 15) in females. Thirteen was the average age at the onset of menses for all females that developed Hodgkin's disease. These women had an average of 2.4 pregnancies each, and in four women the Hodgkin's disease was present during pregnancy. No particular untoward effect of the pregnancies on the course of the disease was remarked, and all were delivered of normal term infants. In view of the clearly greater incidence of Hodgkin's disease in males, and the apparent increased frequency of amenorrhea in females with Hodgkin's disease, there is some indication that ovarian hormones may play a part in the equilibrium of the disease. This might warrant further investigation.

BLOOD PICTURE

Much has been written on the blood picture in Hodgkin's disease. Most observers feel that there is a suggestive blood picture, but that it is not always present, and it is certainly not pathognomonic (Bunting,[5] Falconer,[8] Wiseman[24]). The more common finding is moderate, relative or absolute polynucleosis with lymphopenia. Mononucleosis tends to occur, and although the eosinophil count is usually normal, it may sometimes be very high. With progression of the disease a moderate progressive secondary type of anemia is the rule.

In the hemogram studies in this series of Hodgkin's disease no effort was made to evaluate the blood changes associated with the progression of the disease. It was felt that an analysis of the average blood picture in patients before any treatment, and at least six months before death, would be most informative, especially in regard to a typical Hodgkin's disease blood picture (Table 4). It can be seen that a slight leukocytosis (12,750) is present and the polymorphonuclear neutrophil average is 70 per cent, which is perhaps slightly above normal. The average for the lymphocytes (18 per cent) is below normal and monocytes (7 per cent) are at the upper margins of the normal limits. The mean eosinophilic count was 4 per cent. This included one patient with 68 per cent eosinophilia in a total of 37,000 white blood cells. Not counting this patient, the mean eosinophil count was 2.5 per cent, which is still slightly above a strictly normal mean. The usual moderate anemia, with 12.2 grams hemoglobin and 4,400,000 red blood cells as mean values, was present.

TABLE 4.—*Blood Counts Before Treatment and at Least Six Months Before Death*

	Total Cases	*Mean*
Hgb.	40	12g±2.0
Erythrocytes	40	4,400,000±650.000
Leukocytes	41	12,750±9,600
Polymorphonuclear	42	70±17.3
Lymphocytes	42	18±6.2
Monocytes	42	7±3.7
Eosinophils	42	4±1.8
Basophils	41	0.4±1.5

FEVER

The occurrence of cycles of fever in cases of advanced Hodgkin's disease was noted by Pel[16] and Ebstein[6] and the occurrence of fever in Hodgkin's disease has been frequently remarked since. Baker[1] states that fever is uncommon when only peripheral nodes are involved, and is common when deeper nodes are invaded. Goldman[10] remarks that a rather characteristic feature is a pulse rate which is proportionally at a considerably higher level than the temperature.

In the fever data available in this reported series, it was felt that the information of greatest interest would be provided by trying to relate fever pattern with survival, and also to correlate it with the site of apparent origin of the Hodgkin's disease. For these purposes, the fever was separated into five types: (1) Pel-Ebstein, (2) remittent, (3) intermittent, (4) continuous, (5) none. For each patient, the highest fever recorded was also noted. These data are arranged in Table 5.

Table 5.—*Survival Time After Onset, Correlated with Degree and Type of Fever**

Survival Time in Months	*Degree of Fever*	*Type of Fever*
3	39.4° C	2, 1, 2-4, 3-5
6	37.0	1
9	38.8	1, 1, 1, 1, 2-3, 3, 3-5, 4
15	39.0	1, 1, 2, 5
20	38.8	1, 1, 1, 1, 1, 3, 3-5, 5
30	38.8	1, 1, 1, 5
40	37.8	2-3, 3-5, 3-4, 5
50	39.4	1, 1, 1
60	38.6	1, 2-3, 3
80-140	37.5	2-3, 3-5, 5, 5, 5, 5

*Type 1, Pel-Ebstein; Type 2, Remittent; Type 3, Intermittent; Type 4, Continuous; Type 5, None.

Table 6.—*Site of Primary Tumor, Correlated with Degree and Type of Fever**

Site	*Mean Maximum Fever*	*Type of Fever** *Type*	*Percentage*
All areas of neck and axillas	38.4° C	1	41
		3	18
		5	19
All abdominal sites	39.0	1	50
		3	17
		5	0
All inguinal sites	38.1	1	33
		3	17
		5	33

*See Table 5.

When the cases of Hodgkin's disease are grouped according to the number of months the patients survived, and the type of fever of each group is examined, differences are noted. Of those surviving up to 20 months, only 7 per cent (two cases in 28) were afebrile, whereas 50 per cent had Pel-Ebstein fever, and about 45 per cent had the other varieties of fever. However, in those surviving five years or more, 50 per cent were afebrile, and only 10 per cent had Pel-Ebstein fever. Calculation of the averages of the highest temperatures of each of these survival groups revealed little of significance, although it showed a tendency for those patients with the longest survival to have the lower average maximum temperature.

Correlating the fever type and average maximum temperatures with the apparent primary site of origin of the disease (Table 6) revealed certain tendencies. The average maximum temperature in cases in which the primary site was abdominal was 39.0°C., whereas if origin was in the neck and axilla the average was 38.4° C., and if inguinal 38.1° C. Also in no case in which the abdomen was the primary site was the patient afebrile, and yet 19 per cent of the patients with the neck and axilla as the primary site, and 33 per cent of those in which origin was in the inguen, ran an afebrile course.

SURVIVAL

Data on survival are calculated from the onset of signs and/or symptoms. Since the precise times of onset are based mostly upon the patient's histories, they are not absolutely accurate. The overall average number of months of survival by this method is 41. In Table 7 the survivals have been broken down to show the age and sex of the patients in relation to survival time. The females not only have the disease less frequently, but tend on the whole to outlive the males. This difference is most pronounced in the decades over 40, whereas in the earlier decades the survival is about the same. Epstein[7] found a greater survival of females over males in 384 cases from the literature. However, Slaughter and Craver[18] did not find this difference in their 265 cases.

The survival in relation to the apparent sites of primary tumors is shown in Table 8. The survival for those with the disease starting in the neck or axilla is 41 months, and in the inguinal nodes 42 months, whereas the average survival for five patients with the disease starting in the abdomen or chest is 30 months (although one is yet alive 12 years after onset). These figures represent only a possible trend of survival, since too few cases are available for statistical study.

TREATMENT

X-ray alone was used in the treatment of the great majority of cases. Table 8 indicates that 39 patients out of the 55 for whom the time of death

Table 7.—*Survival Time After Onset*

	Male		*Female*	
Age in Years	*No. of Cases*	*Sur. in Months*	*No. of Cases*	*Sur. in Months*
0-10	3	30	0	....
11-20	3	34	0	....
21-30	14	32	2	31
31-40	6	36	3	21
41-50	9	35	2	72
51-60	7	50	4	86
61-70	1	65	0	....

Average survival: male, 37 months; female, 56 months; combined, 41 months.

Table 8.—*Survival Time Correlated with Therapy*

No. of Cases	*Therapy*	*Survival time in months*
2	None	5
39	X-ray	41
2	X-ray plus Coley's toxin	40
1	X-ray plus radioactive phosphorus	75
4	X-ray plus surgical excision	71
1	X-ray plus Coley's toxin plus cacodylate	102
1	X-ray plus splenectomy	69
1	Gland resection alone	23
1	"Hodgkin's vaccine" only	13
1	Fowler's solution only	23
1	"Hodgkin's vaccine" plus x-ray	23

is known received x-ray alone and had a mean survival time of 41 months. The total number treated by other methods was too small to use as a basis of conclusions as to comparative value of methods of treatment. The short survival of the two patients who received no treatment reflects not so much the lack of treatment as the fact that the disease had so far progressed at the time of entry that therapeutic efforts were considered unwarranted. Surgical excisions in selected cases presenting localized surgically accessible tumor masses has been reported to result in some prolonged survivals, especially when followed by x-ray therapy (Slaughter and Craver[18]). Four patients in our series were treated in this manner. One survived 48 months, another 95 months, while another was alive until lost track of 11 years after the operation, and the fourth, who had a Hodgkin's sarcoma, lived only 11 months. In one case in which treatment was surgical excision alone the patient survived only 23 months.

The introduction of nitrogen mustard therapy is too recent to permit evaluation of therapeutic effects. Although apparently useful in selected cases, especially those in which the lesions are x-ray resistant, it produces severe toxic reactions. Its influence on actual survival time is not known, since it has been available for use for only about the same number of years that the average patient with Hodgkin's disease lives.

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Palliative Treatment of Prostatism

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SUMMARY

A study of 310 patients with prostatism who were not operated upon within a month following the first examination, was made in an effort to determine indications for operation in the patient with mild symptoms of prostatism. This study showed that long duration of symptoms, residual urine of more than 60 cc. and enlargement of the gland beyond Grade I are criteria for the necessity of operation. Palliative treatment is not always indicated. Patients with a soft, boggy prostate and those with more than a slight amount of infection in the prostate are benefited by light prostatic massage once weekly and stilbestrol given in doses of 1 mg. twice daily. Severe infection is treated by chemotherapy and bladder irrigations.

When a patient has mild symptoms of prostatism it is sometimes difficult for the physician to know whether to advise surgical removal of the gland or to recommend palliative treatment. In most patients who have comparatively severe symptoms of difficulty in voiding, frequency and nocturia, prostatic operation is clearly indicated. It is, however, not always so clear whether or not the patient with milder symptoms should be operated upon.

In an effort to determine the result of palliation in patients with prostatism, a statistical study has been made of the case histories from our office files of patients who had symptoms of prostatism and a diagnosis of prostatic hypertrophy, median bar or bladder neck contracture. These cases were selected with a view to obtaining as much information as possible regarding the outcome when treatment was palliative or no treatment was given. In order to eliminate all factors other than bladder neck obstruction due to benign prostatic disease, the following cases were eliminated: All of those in which there was more than a slight amount of prostatitis; those in which there was urethral stricture; those in which the patient had carcinoma of the prostate; and also cases in which the patient had predominating symptoms other than those referrable to bladder neck obstruction. No cases in which the patient was operated upon in less than one month following the first examination were included, and all patients were followed for six months or more. Table 1 shows the length of time during which the patients were observed from the onset of symptoms to the last follow-up report.

By studying these case histories, an attempt was made to determine whether or not the data obtained at the first examination could be used in the prognosis. Could the physician determine by the amount of the residual urine, by the size of the gland, by the duration of symptoms, or by other criteria whether operation was indicated?

In this group of cases, 129 patients or 41 per cent were operated upon after palliative treatment for more than one month or after more than a month in which there had been no treatment. Table 2 shows the reasons why operation was not done within a month after the first examination. It also shows, for each group, the percentage of cases in which operation was done later. The first group consisted of patients who were advised at the time of the first examination that operation was not necessary. Only four per cent of this group were operated upon later. Of those who were in too poor physical condition for operation at the time of examination, 73 per cent later became good enough surgical risks to have the operation performed. There were 131 who were on the borderline as to indications for operation. They were advised to try palliative treatment with the understanding that if it was not successful, operation would be necessary. Of these, 40 per cent had operations later. There were 83 patients who did not wish to have surgical treatment, although it was advised. In this group 77 per cent were operated upon later.

CRITERIA FOR ADVISING METHOD OF TREATMENT

The patient's age was not a criterion as to the necessity for eventual operation nor an indication of

Table 1.—*Total Time Patients Were Followed from Onset of Symptoms to Last Follow-up Report*

Time	*No. in Each Group*
2 years or less	61
2-4 years	88
4-6 years	80
Over 6 years	81

Table 2.—*Reasons Operation Was Not Done Within One Month of Time of First Examination and Per Cent of Each Group Having Surgery Later*

Reasons for Not Operating		*Subsequent Operation*
Not necessary	85	4%
Too poor surgical risk	11	73%
Try palliative	131	40%
Patient did not wish	83	77%

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TABLE 3.—*Age Groups of Patients in This Study*

		Results Obtained—Per Cent of Each Group				
Age Groups	*No. of Cases*	*Good*	*Fair*	*Poor*	*Operation*	*No Operation*
Under 50 years	13	15%	54%	31%	38%	62%
50-59 years	86	26%	46%	28%	38%	62%
60-69 years	122	19%	48%	33%	48%	52%
70 years and older	89	22%	45%	33%	39%	61%

TABLE 4.—*A Comparison of Amount of Residual Urine with Results of Treatment and Eventual Operation*

		Results Obtained—Per Cent of Each Group				
Residual Urine	*No. of Cases*	*Good*	*Fair*	*Poor*	*Operation*	*No Operation*
Less than 60 cc.	192	28%	54%	18%	33%	67%
60 cc. or more	118	11%	34%	55%	62%	38%

the result which would be obtained by non-surgical treatment (Table 3).

Residual urine. Table 4 shows that 62 per cent of patients with more than 60 cc. residual urine obtained at the time of the first examination, required prostatic operation later, whereas the operation was done in only 33 per cent of the group who had less than 60 cc. of residual urine.

Size of the prostate. (Table 5). Patients who had hypertrophy larger than Grade I were more likely to require operation than those with hypertrophy of Grade I or less, including among the latter those with median bars and bladder neck contractures.

Duration of symptoms. This study showed that the longer the patient had had symptoms prior to the first examination, the more likely the need for operation eventually. (Table 6).

The results of palliative treatment or of giving no treatment were somewhat difficult to evaluate. Generally, the patients in whom results without operation were poor were those who required operation eventually. This is shown in all the tables by the statistical correlation between the results of treatment and the percentage of cases in which operation was done later. The patients who had no treatment and those who had palliative treatment of some form are grouped together, for the treatment given the latter group was not very specific and was sporadic. It was difficult to evaluate the difference between the two groups. There are certain instructions, however, that should be given to each patient who has symptoms caused by bladder neck obstruction, and for whom operation is not immediately indicated. He should be told to avoid holding the urine after he has the desire to void, for when voluntary retention occurs edema of the mucosa of the bladder neck and prostatic urethra results and there is danger of acute obstructive symptoms developing. The patient should also avoid sexual excesses, becoming chilled, and drinking an excessive amount of liquor, for these may also produce edema with resulting acute obstructive symptoms. Palliative treatment of hot sitz baths each evening will frequently help to prevent onset of acute symptoms in these patients. If the prostate is congested, as indicated by a soft and boggy consistency when palpated through the rectum, light prostatic massage may help to reduce the congestion and give relief of symptoms. This treatment is also indicated in the patient who has more than ten to twelve pus cells per high dry field in the prostatic fluid.

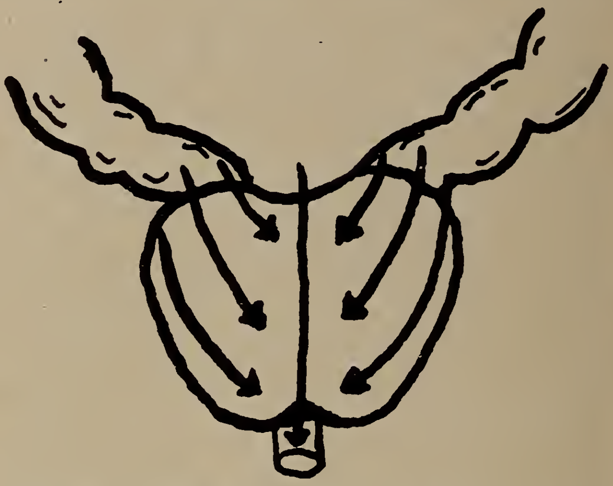

Figure 1.—Massage of prostate. Arrows indicate direction and extent of massage.

It is important that prostatic massage be performed properly (Figure 1). The finger is placed as high as possible in the rectum, reaching to the upper edge of the prostate, or beyond to the lower end of the seminal vesicle if possible. With a slow gentle stroke downward and medialward, the edge of the prostate is massaged down to the midline. The finger is again placed as high as possible and the next stroke is slowly made down to the midline, terminating a little above the end of the first stroke. The third stroke is started a little medial to the second and brought down to the midline again. The same procedure is repeated on the opposite side. In patients who have had very little previous treatment, the prostate should be covered in this manner only once or twice, and for those who have had numerous previous massages it should be done three or four times. After the strokes from lateral to medial and downward have been completed on each side, one or two gentle strokes downward over the median groove are made in order to empty the prostatic fluid from the urethra. It is important that the strokes be made very slowly, for if they are rapid, not enough time is given

TABLE 5.—*A Comparison of the Size of the Gland with Results of Treatment and Eventual Operation*

		Results Obtained—Per Cent of Each Group				
Size of Gland	*No. of Cases*	*Good*	*Fair*	*Poor*	*Operation*	*No Operation*
Grade I or less	136	32%	48%	20%	32%	68%
Over Grade I	174	12%	48%	40%	49%	51%

TABLE 6.—*A Comparison of the Duration of Symptoms to First Examination with Results of Treatment*

		Results Obtained—Per Cent of Each Group				
Duration of Symptoms	*No. of Cases*	*Good*	*Fair*	*Poor*	*Operation*	*No Operation*
Less than 3 months	26	46%	35%	19%	24%	76%
3 months to 1 year	52	23%	48%	29%	29%	71%
1-3 years (incl.)	119	24%	52%	24%	32%	68%
More than 3 years	113	13%	44%	43%	61%	39%

for the prostatic fluid to exude through the small prostatic duct orifices.

Although stilbestrol in the treatment of benign prostatic hypertrophy is almost valueless, there are certain conditions in which it is beneficial. If the prostate is soft and boggy, indicating congestion, stilbestrol in doses of 1 mg. twice a day will frequently aid in reducing the congestion. It is also of value to reduce libido in patients who have a tendency toward sexual excesses.

If there is infection of the urine accompanying prostatism, chemotherapy is indicated. As a general rule sulfathiazole, sulfadiazine, or penicillin are preferable for the treatment of gram-positive coccal infection and sulamyd (sulfacetamide) or streptomycin are more effective in combating the gram-negative bacilli group.

Catheterization and bladder irrigations are not indicated in the patient who has only a small amount of residual urine and in whom there is minimal infection. Patients who are too poor a risk for operation and who have a large amount of residual urine and considerable infection in the bladder are frequently helped by catheterization or in-dwelling urethral catheter and bladder irrigations.

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Unilateral Paralysis of Eye Muscles Associated with Intracranial Saccular Aneurysms

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SUMMARY

Unexplained unilateral paralysis of eye muscles with or without evidence of altered function of other cranial nerves, or of the presence of intracranial bruit, is strong positive diagnostic evidence of saccular aneurysm of the intracranial internal carotid or of the circle of Willis. If pulsating exophthalmos is present the lesion probably is an arteriovenous fistula.

The presence of such clinical signs strongly indicates the desirability of cerebral angiography. Once demonstrated, the lesion can usually be treated successfully by ligation of the contributing vascular connections.

SUDDEN one-sided paralysis or weakness of any movement of the eyeball should suggest the possible presence of an intracranial saccular aneurysm of the internal carotid artery or one of its major branches. The usual complaint will be of a drooping eyelid or of double vision. Additional symptoms may indicate involvement of other cranial nerves as well. There may be loss of vision in one eye or in both, suggesting pressure on the optic tract or the chiasm. Pain or hypesthesia in the distribution of the trigeminal nerve may be present if this region has been affected: the corneal reflex may be diminished or absent. Should the aneurysm have ruptured, the usual signs of subarachnoid hemorrhage may be found. Occasionally a bruit can be heard, but its absence does not point away from aneurysm as a causative lesion in this syndrome of the region of the cavernous sinus. In our experience the presence of a bruit is unusual.

If there is an associated unilateral exophthalmos, particularly of the pulsating type, an arteriovenous aneurysm between the internal carotid and the cavernous sinus should be suspected. In such circumstances a bruit is usually to be heard.

An untreated aneurysm is liable to rupture, as was demonstrated by McDonald and Korb (1939)[4] who reported such an occurrence in 786 of the 1,125 instances of intracranial aneurysm they found in the literature. The leaking or rupturing of an aneurysm is not necessarily fatal, although the prognosis increases in gravity with each successive bout of intracranial bleeding. Few persons survive the third hemorrhage from such a process. The mortality rate in untreated intracranial aneurysm must be considered to be high.

The possible fate of the patient with undiagnosed and untreated aneurysm of the carotid or of the circle of Willis is illustrated by the history of a woman in her early forties who was said to have been in good health until the onset of the terminal illness, which commenced one evening with the sudden appearance of diplopia. This progressed in a few minutes to complete paralysis of the third nerve, and there was transitory headache on the same side. She was hospitalized for two weeks, during which time the oculomotor palsy showed no improvement, although the headache subsided completely in the first few days. On the night after discharge she was awakened by severe, intolerable generalized head pain. This quieted somewhat, but recurred in about 13 hours, being immediately followed by loss of consciousness, respiratory failure and death.

This patient had a saccular aneurysm of the left carotid artery. The initial symptom was a third cranial nerve paralysis, which even preceded the symptom of subarachnoid hemorrhage. By current methods of study, the outlook in her case should have been better. A presumptive diagnosis of saccular aneurysm would have been made and angiographic studies instituted, followed by definitive therapy directed toward the presumably demonstrable lesion.

In recent years the authors have seen nine patients with saccular aneurysm of the carotid artery or circle of Willis. Angiograms confirmed the diagnosis in each case. In three patients the initial symptom was paralysis of extraocular movement. Involvement of other adjacent cranial nerves, principally the trigeminal, or symptoms resulting from frank subarachnoid bleeding were seen as initial signs in the other six patients.

Two patients were males and seven females. The age at the time of onset ranged from 3 to 53 years. All aneurysms were treated by ligation of the carotid artery in the neck, and in two patients the aneurysm was trapped by clipping the vessel intracranially. The youngest patient, who was 10 at the time of operation, developed hemiparesis 54 hours after carotid ligation. No other undesirable sequelae have been encountered.

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In all instances oculomotor paralysis was a prominent feature in the clinical diagnosis. To emphasize the importance of this sign, brief histories are given of the three patients in whom it appeared as the initial symptom.

Case 1. A 53-year-old woman noticed some diplopia, particularly when she was reading, doing a considerable amount of work with her eyes, or when she was tired. This had become progressively worse over a period of eight months. At the same time she noticed a progressive droop of the left eyelid and a tendency for the eye to turn outward.

Approximately six months before entering the hospital she had periodic headaches on the left side of the head, localized behind the left eye. Sometimes the pain was sharp and throbbing; sometimes it was only a dull, retro-orbital and temporal ache. The headaches were not continuous, but occurred almost every day and would last for several hours. The patient was treated for migraine. Frank double vision was recognized by the patient at about the same time that the headaches appeared. This situation continued up to the time of her admission for study. On examination, the striking observations were the ptosis of the left eyelid, the weakness of all movements related to oculomotor nerve function, and a generalized hypalgesia of all divisions of the fifth cranial nerve, but particularly of the ophthalmic branch. A diagnosis of aneurysm of the carotid artery or the circle of Willis on the left side was made and angiographic studies were carried out.

The resulting film showed a saccular aneurysm arising from the cavernous portion of the carotid artery in a position where it could be expected to cause pressure upon the third and fifth cranial nerves. Tying of the internal and external carotids in the cervical region did not relieve the patient's oculomotor palsy which progressed to a complete lesion; therefore a trapping of the aneurysm by intracranial approach was deemed necessary.

At operation there was found to be pressure on the third cranial nerve before it entered the wall of the cavernous sinus and the anterior clinoid. The artery and the optic nerve were displaced mesially. Tantalum clips were placed just proximal to the middle and anterior cerebral arteries. Postoperatively the patient's course was satisfactory. There was no loss of vision in the left eye.

Case 2. A 43-year-old woman had diplopia of sudden onset without apparent cause two years before examination. She observed that this was worse on gaze to the left. Eleven months later she noted drooping of the right upper eyelid. Two months before admission maxillary pain on the right appeared and progressed in the following weeks to an excruciating degree.

On examination paralysis of all extraocular movement was found. There was anesthesia of the upper portion of the face on the right side and hypesthesia of the lower portion. The muscles of mastication were paralyzed on the right.

Plain roentgen films showed erosion of the base of the skull, and carotid angiography demonstrated a saccular aneurysm just proximal to the cavernous sinus to be the cause of the difficulty. Ligation of the internal carotid was carried out with satisfactory results.

Case 3. A woman 54 years of age suddenly developed double vision 16 months before hospitalization. This persisted and an unsuccessful attempt was made to correct it with glasses. One month before admission she noted progressively increasing pain in the region behind the right eyeball. Angiography demonstrated abnormal narrowing and displacement of the carotid. Craniotomy was performed and an aneurysm at the site of vascular distortion was trapped between ligation in the neck and clips distal to the defect intracranially.

DISCUSSION

In recent years the problem of saccular aneurysm of intracranial vessels has increasingly commanded the attention of neurologists throughout the world. Although the problem has been the subject of discussion in the literature for over 150 years, aneurysms were still a clinical rarity at the close of the first World War. Only in the past 20 years, since the pioneer work on cerebral angiography by Egaz Moniz, has any consistency in diagnosis and treatment been developed. Today a high percentage of these potentially fatal lesions, particularly those in the anterior part of the circle of Willis and its immediate branches, can be alleviated if recognized clinically, confirmed by angiography and treated early. The importance of unilateral extraocular muscle paralysis as a localizing sign for aneurysms in this region has been stressed by others. Its importance as a diagnostic sign would seem to justify further emphasis.

A discussion of the anatomical basis for the involvement of the oculomotor, trochlear and abducens nerves by aneurysmal lesions in adjacent vessels may serve to emphasize the importance of eye signs.

The internal carotid artery enters the skull by way of the carotid canal in the petrous portion of the temporal bone where it becomes surrounded by a projection of dura mater. Passing beneath the trigeminal nerve in Meckel's cave, it curves cephalad and forward lying within the cavernous sinus and close to the lateral aspect of the body of the sphenoid. As it swings upward toward the mesial aspect of the anterior clinoid, it penetrates the dura, giving off in this region its first large branch, the ophthalmic. Through the ophthalmic the internal carotid has extensive anastomotic connections with the external carotid of the same and opposite sides (Walsh and co-workers).[5] Continuing between the optic and oculomotor nerves, the carotid divides into the anterior and middle cerebral vessels above and lateral to the optic chiasm. Just before this bifurcation, it receives the posterior communicating artery which runs above and roughly parallel with the oculomotor nerve to connect with the posterior cerebral artery. The circle of Willis is completed anteriorly by the anterior communicating artery which connects the two anterior cerebral vessels.

While the ophthalmic is the first major branch of the carotid after its bifurcation in the neck, it should be remembered that six vessels or sets of vessels are described as arising from the petrous or cavernous carotid before it reaches the ophthalmic. These are the caroticotympanic, the vidian, the cavernous, the hypophyseal, the semilunar, and the anterior meningeal branches. In order to understand the pathogenesis of aneurysms in this portion of the carotid artery, it is important to remember these smaller branches.

The oculomotor nerve, as it passes forward from its origin in the brain stem toward the dura of the cavernous sinus, parallels the posterior communicating artery on its medial side (Whitnall).[6] Although it reaches the dura at the posterior clinoid, it has been shown by Laphart (1925) (see Whitnall, pp. 323 and 322)[6] that the nerve is excluded from the sinus proper until after it has dipped beneath the anterior clinoid process. In the cavernous sinus wall the nerve lies above and somewhat lateral to the carotid. It passes forward below the ophthalmic nerve and below and medial to the trochlear to enter the orbit through the superior orbital fissure (Whitnall). Within the cavernous sinus the oculomotor receives sympathetic fibers from the carotid plexus as well as sensory fibers from the first division of the trigeminal (Whitnall, p. 334).[6]

The trochlear nerve lies just lateral and inferior to the oculomotor in the cavernous sinus wall. It is somewhat more laterally placed with reference to the carotid but could be involved, alone or in conjunction with other nerves, by a suitably located aneurysm. In the anterior part of the sinus it crosses and is connected with the third nerve as it rises to a point above it and parallel with the ophthalmic at this level. It, too, receives communications from the cavernous plexus and from the ophthalmic division of the trigeminal. The sixth cranial nerve, as it passes through the cavernous wall, lies inferior to the artery and to the above described nerve complex.

It is seen, therefore, that aneurysms of the intracranial and cavernous portions of the carotid artery, as well as of the posterior communicating, the proximal portion of the middle cerebral, and the proximal portion of the anterior cerebral, may well be in a position to affect the nerves of ocular motion, particularly the oculomotor. The vessels named are frequent sites of saccular aneurysms.

Congenital saccular aneurysms arise from weak areas in the walls of intracranial arteries where there has been incomplete involution of the embryonal vessels (Dandy),[1] or from defects at the point of bifurcation of larger intracranial vessels (Forbus).[3] Although miliary aneurysms due to atheromatous changes in the walls of smaller blood vessels in older people are said to occur somewhat more frequently (Walsh and co-workers),[5] it is the congenital aneurysm which is of greatest clinical interest from both the diagnostic and therapeutic standpoints.

Saccular aneurysm of the intracranial vessels is a fairly common malady. Dott,[2] in a review of the literature in 1933, estimated that the lesion was found in approximately one in 700 consecutive postmortem examinations. Many of these, however, had neither produced symptoms nor contributed to the cause of death. Intracranial aneurysms arise most frequently from the carotid artery or its principal connections. McDonald and Korb[4] described 774 of 1,023 aneurysms as originating on these vessels; 480 were on the carotid or the anterior circle of Willis. Fortunately, it is in these locations that they are most easily diagnosed by clinical signs, including the ones under discussion, as well as by angiography. They are the ones which offer the best opportunity for successful treatment.

Arteriovenous fistula usually is a more dramatic disease since in the acute stage there is added to the signs of cranial nerve involvement a pulsating protrusion of the eye which becomes, therefore, the prominent sign of this potentially serious lesion. Chronic fistulae, however, may simulate many of the signs and symptoms of saccular aneurysm and therefore should be mentioned.

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Adoption Procedures in California

What Physicians Should Know About Them

James V. Campbell, M.D., *Oakland*

SUMMARY

With demand for adoptable babies offered through agencies far exceeding the supply, independent and "black market" adoptions have increased.

Although adoptions through agencies are looked upon as better ultimately for both the child and the foster parents, the process is a slow one and the period of waiting for a suitable child often discouragingly long. In this regard an increase in the number of agencies would be helpful, but little use has been made of legislation permitting the organization of such agencies in California counties. There are many ways by which physicians may promote adoptions through existing agencies and the setting up of additional organizations for the purpose.

PROCEDURES for adoption of children in California have been criticized by the public and the medical profession, and critical articles have been published in magazines and newspapers. Complaints are based mainly on the prolonged waiting period between the time a couple applies to adopt a baby and the actual adoption. With the demand for adoptable babies much greater than the supply, the number of independent adoptions and "black market" adoptions has increased apace. In the interest of clarification, the Alameda County Medical Association appointed a committee to review the existing situation and to make recommendations. In the course of its work the committee has reviewed the report of the California Adoption Survey Committee (published in November, 1946), which is the principal source of information upon which this presentation is based.

The State of California recognizes four types of adoptions: (1) independent adoptions; (2) agency adoptions; (3) step-parent adoptions; (4) adoptions of illegitimate child by natural father. The latter two are not a concern of the medical profession, although step-parent adoption comprises almost half of all adoptions.

In independent adoptions a petition is filed with the superior court of jurisdiction by the prospective adopting parents with whom the child has been placed directly by the natural parent or parents. The State Department of Social Welfare or county adoption agency is responsible for obtaining necessary consents and investigating and reporting to the court on adoptions of this type. One hundred and eighty days are allowed for investigation to determine whether the child is adoptable and whether the home in which it has been placed is suitable. If the determination cannot be made within that time, however, the court may grant an extension.

In agency adoptions the parent or parents relinquish the child to a licensed adoption agency which selects from the applicants who have been studied and approved by it, the adoptive parents it considers best able to meet the needs of the particular child. After the child is placed in the adoptive home it remains under the supervision of the agency for one year before the agency will give its final approval to the adoption. Then jointly with the adopting parents it petitions the court to grant the adoption.

There is no doubt that adoption agencies make generally better placements from the point of view of the baby, the natural parents and the adoptive parents than is accomplished by independent adoptions.

The legal and practical implications of *relinquishment* (to an agency) as compared to *consent* (in independent adoptions) are numerous.

1. In agency adoptions by *relinquishment,* the legal custody of the child rests with the agency until adoption is completed. In independent adoptions the signing of *consent* by the natural parents does not terminate their right to, or responsibility for, the child, nor does this act without further proceedings transfer custody of the child to the adopting parents. Therefore, should the natural parents have a change of heart before the petition for adoption has been filed in the superior court in the county in which the petitioner resides, they may take the child back.

2. In agency adoptions by *relinquishment,* the identity of the child is lost to the natural parents, while in *consent* adoptions the natural parents are aware of the identity of the adopting parents. In the latter case, should the natural parents have a desire to see or contact the child, a great deal of embarrassment could be caused. Frequently this has happened.

3. In agency adoptions, a thorough investigation of *both* the natural parents, the child, and the adoptive home is made before any baby is placed. As far as the natural parents are concerned, this means the *relinquishment* has been signed, an investigation has been made to determine whether either parent has physical or mental defects, and a social history of the parents has been completed, including such things as racial background, religion, and social background. With this knowledge, the child can be matched appropriately with adopting parents. The child also is observed for physical or mental defects

which might make it unsatisfactory to its future parents. By these means, unfortunate adoption of a baby of one racial background by parents of another, or the placing of a baby of low mentality with parents of high intelligence, can be avoided.

Of almost as much importance is the investigation of the adopting parents to determine their social stability, their relative financial security, their racial and religious background.

In independent adoptions the investigation by the State Department of Social Welfare or the county adoption agency is made *after* the placement has been made. The Department has no authority in such cases until the petition for adoption has been filed, which may occur weeks, months, or even years after the placement. The natural parents often make no investigation of the home of the persons to whom the child is released, and frequently the persons accepting the child know little or nothing of the child's background or potentialities.

If it is agreed that agency adoptions are preferable to the independent adoption method, facilities for adoption through agencies should be increased. For the 18 months ended June 30, 1947, there were 494 petitions for independent adoptions filed in Alameda County, 53 per cent for adoption of illegitimate children. In this same period there were only 144 relinquishments to adoption agencies.

There are two volunteer agencies in this state which are licensed by the California Department of Social Welfare to handle adoptions—the Children's Home Society and the Native Sons and Daughters Central Committee on Homeless Children. Both are private agencies whose financial support comes from voluntary contributions. They have done and are doing a very efficient job but their finances and personnel are so limited that it has been impossible for them to increase their case load. It is difficult for them to maintain even their pre-war quantity.

As a result of the recommendations of the California Adoption Survey Committee and various other interested individuals and agencies, the 1947 Legislature amended the adoption laws to provide for the licensing of county adoption agencies, the agency to be designated by the county board of supervisors. In order to be licensed the agency must meet the standards for child placing agencies adopted by the State Social Welfare Board, the same standards being applicable to private and public adoption agencies. The administrative costs of the program will be paid from state funds and a portion of the cost for the care of the child prior to placement for adoption may also be paid from state funds. The agency may charge the adopting parents for the costs of care of the child up to $200 and will be reimbursed by the state up to $200 on any additional costs.

San Diego County Department of Public Welfare is the only county agency which has been licensed so far. No other has filed an application, although a number have shown interest and are considering it.

Certain safeguards are provided to protect the child who is given up by his parents. The law provides that it is a misdemeanor for any person (other than the parent) or organization or agency to place a child under 16 years of age either for temporary care or for adoption without having a written license or permit to do so. A regulation of the State Department of Public Health provides that any hospital or maternity home dismissing an infant from the hospital to a person other than the parent or relative must report the fact to the State Department of Social Welfare within 24 hours.

There are certain other facts in regard to adoptions that it would be well to know. The petition for adoption must be filed in the superior court of the county in which the persons adopting the child reside. The law was amended by the 1947 Legislature to provide that the hearing shall be in private with all persons excluded except the officers of the court, the child, the adopting parents, their counsel, and the representatives of the agency present to perform their official duties. The records of the adoption in the office of the county clerk are regarded as confidential and are not open to inspection by any persons other than the parties to the action and the State Department of Social Welfare, except on the written authority of the court. After adoption, the child has all the legal rights of the natural child, and may have a new birth certificate issued in his new name as though he were the natural child of the adopting parents, and this certificate is the only one open to public inspection.

Now that increased facilities can be established making it possible to speed up the process of adoption, those wishing to promote adoptions through agencies may do so by:

1. Supporting and urging an increase in facilities and personnel of existing volunteer agencies.
2. Encouraging prompt action by county welfare departments to set up the necessary machinery whereby adoption may be more readily accomplished. This should include well trained personnel and adequate rules so that the best end results may be obtained.
3. Referring any patient who contemplates having her child adopted to some agency which can advise her of available facilities.

The present volunteer agencies may be contacted through their district offices:

Children's Home Society of California
3100 W. Adams Street, Los Angeles 16, California (State Headquarters)
995 Market Street, San Francisco 3
645 A Street, San Diego 1, California.

Native Sons and Daughters Central Committee on Homeless Children
1095 Market Street, San Francisco 3
3924 Sunset Boulevard, Los Angeles, California.

360 Twenty-Ninth Street.

The Significance of Some Mental Disturbances During Convalescence from Surgical Operations

J. G. Rushton, M.D., *Los Angeles*

SUMMARY

Early recognition and treatment of mental disturbances following operation may reduce the gravity of the complication and improve the prognosis. To aid in recognition, postoperative mental disturbances may be classified in accordance with the relative importance of organic as contrasted with psychogenic factors in development of them. Treatment of disturbances falling within any of the three classifications should be begun even before the exact classification is definitely established. It consists initially of promoting adequate nutrition, sedation with paraldehyde if necessary, constant special nursing care if possible, and frequent reassurance of the patient by the physician.

MENTAL disturbances during the postoperative period add to the morbidity of the operation and at times constitute a grave complication. Prompt recognition and early treatment of them can materially reduce this morbidity. A study of these postoperative mental disturbances suggests that they may be classified on the basis of the relative importance of organic as contrasted with psychogenic factors in the evolution of the reaction.

1. Toxic delirious reactions in individuals without evidence of previously existing damage to the central nervous system.
2. Toxic delirious reactions engrafted on already existing damage to the central nervous system.
3. Functional psychotic reactions precipitated by the stress of surgical operation.

The toxic delirious reactions usually appear after a latent period of from two to twenty days during which convalescence from the operation appears to be progressing satisfactorily. Such reactions may begin suddenly and dramatically or may begin insidiously with intervals of confusion and delirium first appearing at night, then gradually extending throughout the 24 hours. The symptoms may disappear after a few days or may endure for as long as several weeks. These reactions are characterized primarily by a disturbance in the level of consciousness, to which may be added disturbances of motility and of mood and a disordered thought content. The disturbance in level of consciousness may be characterized by a superficial alertness, the morbid nature of which is betrayed by the patient's distractibility and brief span of attention. More common, however, are various degrees of somnolence or stupor. Oftentimes the disturbance of motility is mild and is characterized only by disorganized unproductive activity such as restless movements of the extremities or picking at the bedclothes. At times, however, the activity of these patients may be so vigorous as to endanger their own welfare.

The disorder of mood is usually characterized by anxiety and depression of variable degree. The patient may have some awareness of the altered state of his mentation and experience distress over this change. The thought content is often characterized by hallucinations, those in the visual sphere occurring more commonly than those in the auditory sphere. Delusions are common but are apt to be changeable and unsystematized. During the early stages of the onset of such a reaction, the patient may be considered merely petulant or stupid. As the reaction develops the character of his thinking regresses to a childish and concrete level.

In reviewing the history of the patient's previous life, it is common to find that he has never before suffered any psychotic reaction. At times, however, it is learned that under similar circumstances, following an operation or in the presence of a severe infection, the patient has had a similar reaction. Age does not appear to play any significant part in the occurrence of reactions of this type. It may be presumed that the chief precipitating factors are the absorption of disintegrating tissue products and the nutritional deficiencies induced by the surgical operation and attendant procedures.[5]

The treatment of these conditions is similar to the treatment of any toxic delirious state.[2] It is important to promote adequate nutrition even by means of nasal tube feedings if necessary. It is unwise to rely entirely on the administration of intravenous fluids to accomplish this end. In the ordinary general hospital where the noisiness of these patients may produce a serious disturbance, it is usual for sedatives to be used in large amounts in an attempt to control the symptoms. Quite frequently the injudicious use of sedatives merely aggravates the delirious state. The use of barbiturates and bromides should be avoided. Paraldehyde is the sedative of choice[2, 9] and should be used in sufficiently large dosage to insure rest or sleep. As a rule 15 to 20 cc. may be given as an initial dose and the drug may be repeated in doses of 8 to 10 cc.

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every two hours until the desired effect has been produced. If the drug is given by mouth, it is well to disguise the unpleasant taste as much as possible by giving it in iced lemon or grapefruit juice. The drug may also be conveniently administered by rectum or may be given intravenously with safety. When given by this latter route it may cause fits of coughing during the time it is being injected.

Violent motor activity on the part of the patient may necessitate mechanical restraint, but this should be used as sparingly as possible. As a rule side rails on the bed are not only an inconvenience to the attendant, but are actually an added hazard to the patient. These delirious reactions constitute a potentially grave emergency and justify constant attendance by special nurses whenever possible. Prolonged confinement in bed is highly inadvisable and as soon as possible the patient should be allowed out of bed. It is important to keep the patient's environment as stable as possible and to avoid sudden noises, shaking of the bed and unusual odors. As dim lights and shadows tend to confuse and frighten the patient, the room should be well lighted at all times. An especially important function of the special nurses should be to keep the patient in contact with reality and, with the attending physician, to offer frequent explanations and reassurance to the patient. Prognosis for ultimate recovery is good.

An example of this type of reaction is the case of a 38-year-old married woman who entered the hospital because of excessive vaginal bleeding. At operation the uterus, fallopian tubes, ovaries and appendix were removed. Three days after the operation, it was noted by the night nurse that the patient had become disoriented as to place during the night. The following day the patient thought she saw a man at the window, attempted to get out of bed, picked at the sheets and was mildly agitated. She misidentified people who passed her room and thought that her father, son and other relatives were standing just outside. On one occasion she thought that she saw the physician standing at the window laughing at her and on another occasion expressed the belief that her husband was dead. Within a period of a week the patient's condition had materially improved in that the psychotic features of her illness had subsided and she remained only somewhat anxious and apprehensive. Further convalescence was uneventful.

A similar type of toxic delirious reaction may occur in persons who have already suffered organic brain damage. The most common cause of damage of this type is cerebral arteriosclerosis or the degenerative changes associated with senility. The character of onset, the nature of the psychotic reaction and the treatment remain essentially the same.[1, 4, 8] The prognosis, however, must necessarily be more guarded. The presence of preexisting and unalterable organic damage means that as a rule recovery will not be complete. This incomplete recovery may be especially apparent to relatives who had not noticed, previous to the operation, the early subtle mental changes that may be associated with advancing arteriosclerosis or the advent of senility. It is by no means justifiable to look upon these reactions as hopeless and as representing altogether irreversible damage due entirely to vascular or senile mental changes. The regression of the delirious state may well leave the patient in relatively good mental health and the final prognosis should be reserved until the patient has had benefit of adequate therapy.

An example of such reactions is the following: A man 79 years of age was operated on for the repair of a right inguinal hernia. Three days after the operation the patient was noted to be "foggy—not orientated." The patient became restless, finally agitated and irrational. He was of the opinion that he had "finished that piece of work" and was feeling rather satisfied with himself. He thought that he was in an old store on Main Street and that the cross streets had not yet been named. He spoke with animation of picking olives and of developing a method of producing uniform color of the olives. Treatment consisted of inducing the patient to take adequate food and fluids. Paraldehyde was used as a sedative. At the end of approximately two weeks the acute symptoms of the psychotic reaction had subsided. At that time the patient was feeling quite well and except for a tendency to be somewhat rambling and repetitious in his conversation and mildly forgetful of recent events, his mental condition was satisfactory.

The third category of mental symptoms to be discussed embraces those reactions in which a major functional psychosis has been precipitated by the stress and trauma of a surgical operation. These reactions may appear immediately after operation or their appearance may be delayed for several days. The type of reaction is largely determined by the patient's previous personality, but is usually either of schizophrenic or manic-depressive character. During the early phases of their development, these reactions may be complicated by toxic delirium. Differentiation between major functional psychosis and toxic delirium at this stage can be far more easily made on paper than at the bedside. In the presence of true clouding of consciousness, it is inadvisable to make a diagnosis other than of toxic delirium. If toxic delirium is thought to exist, the initial treatment should be directed toward this condition. As the symptoms of the toxic delirium subside and the functional psychotic reaction emerges, it is important to evaluate it as early as possible since the average general hospital is not adequately equipped to provide care for the patient. For this reason arrangements should be made as soon as possible for care in an appropriate psychiatric hospital, if such care appears to be indicated.

It should not be presumed, however, that treatment of these reactions must await transfer to a psychiatric hospital. The fact that the patient is rendered relatively helpless following operation, or the nature of the surgical procedure itself,[6, 7] may activate latent anxieties to such a degree that a psychotic reaction results. During the early phases of its development this reaction may be alleviated by discussion of these anxieties and reassurance concerning them. Such prompt attention may at times prevent the development of a more severe and lasting morbid reaction.

An example of this type of reaction is the case of a 65-year-old unmarried woman who was operated on for carcinoma of the rectum. A colostomy was made and the rectum was removed. The patient's convalescence seemed satisfactory for the next ten or eleven days. At the end of that time the patient began to lose strength to the point where she was unable to turn over in bed without aid from the nurse. She became nauseated and would not eat. Although the colostomy functioned well and the patient had been assured that the tumor was successfully removed, she felt "discouraged." She was quite certain that she could not get well. Thoughts of the colostomy were repugnant; she felt "unclean" and unable to face her friends. She would weep often as the result of these thoughts.

This patient had been reared by an over-solicitous mother who was morbidly concerned with the health of her children. The patient was always excessively meticulous and conscientious. Especially prominent was her inordinate concern about body cleanliness. Treatment of her condition consisted of long discussions concerning her ideas of cleanliness and her need for neatness. The means of caring for her colostomy were discussed in detail. In addition, the patient was repeatedly reassured that she would ultimately recover good health. At the end of two weeks the patient had improved enough to be able to take food fairly well and was even able to walk short distances in the hall. Within three months from the onset of her depressive reaction she was again relatively well-adjusted and carrying on her usual daily activities.

COMMENT

The role which surgical operation plays in precipitating these mental disturbances is probably not specific. The operation would appear to be merely one of several similar types of stress which may precipitate similar mental disturbances. Acute febrile illnesses, severe trauma and childbirth may be followed by disturbances of this kind. Classification and treatment of them may profitably be carried out along similar lines.[3]

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Discussion by A. Vincent Gerty, M.D., *Pasadena*

The presentation of such a paper as Dr. Rushton's brings to our attention certain factors that may be utilized in preventing a rather costly convalescence or even mortality.

As I read Dr. Rushton's paper, prevention seemed to me the thing of greatest importance. It implies that to prevent postoperative psychosis, or to decrease the occurrence of such conditions, two things should be stressed: (1) A very thorough chronological history, and (2) better mental evaluation of the patient.

The family and personal history should be examined for mental disorders, alcoholic tendencies, drug addictions, psychoneurotic backgrounds.

This calls to my memory one case in which a thorough history was taken regarding the necessity of operation but the history of mental illness in the family and in the patient was not obtained—because the family purposely evaded the issue, feeling that the hysterectomy proposed would prevent certain mental symptoms which they saw developing from previous experience. Two days after operation the patient developed frank psychosis; later, evisceration peritonitis developed and the patient died.

If history of alcoholism or drug addiction is elicited, proper therapy with paraldehyde and fluids to prevent the toxic reaction following operation may prevent psychosis.

The second factor is the evaluation of the patient's personality by watching his attitude and behavior and following his stream of conversation. Thirdly, the emotional reactions should be noted, analyzing to a certain degree the patient's elations, expressions, fears, and swings of mood. Fourth, the content of thought should be observed to gain some insight into the patient's philosophy of living and life. Fifth, a survey of the patient's judgment, reasoning and insight may give some concept of his mental grasp of the seriousness and the nature of the surgical procedure.

Discussion by Walter F. Schaller, M.D., *San Francisco*

Although in most cases of postoperative psychosis the patient ultimately recovers, the occurrence of such complications, always a matter of concern to the physician, raises the question as to the cause: Was it entirely psychological, was some unknown toxic factor responsible, were degenerative or arteriosclerotic brain changes present, or was there some inherent constitutional factor? These latter possibilities fall within the scope of neuropsychiatry in its proper application of the term, namely, the relationship of neurology to psychiatry.

Psychiatry has become so overwhelmingly oriented in the psychological approach that Dr. Rushton's presentation offers a very timely opportunity to stress organic causes of mental disturbances such as are activated by interferences with normal bodily processes, namely, surgical operation. Firstly, we have delirious states, so precisely and clearly outlined by the writer and most probably determined by toxic effects of tissue destruction; secondly, pathologic change within the brain itself; and, thirdly, the genetic factor so convincingly demonstrated by Kullman in his study of identical twins. In a paper read by Doctors Wilson and Rupp before the Section on Nervous and Mental Diseases of the American Medical Association in San Francisco in 1946, tabulations revealed a surprising incidence of mental disorders of all classes associated with organic diseases of the brain and other organs; in fact, there were such associations in somewhat over half of all cases in mental hospitals. Surprisingly, little is mentioned of these facts in present day psychiatric literature, which on the other hand, overstresses environmental and developmental factors, particularly in the tenets of the psychoanalysts.

As to treatment, I agree that paraldehyde is a very effective sedative and much more satisfactory in its effects than many of the newer pharmaceutical products. If it were not for the disagreeable taste and smell of this drug, it would probably displace many of those now in common use. I have, however, in selected cases used bromides and the barbiturates. The former must be closely checked for toxic and cumulative effects; the latter for prolonged action and side effects, especially of dreams and for aggravation of delirium.

Surgical Treatment of Myasthenia Gravis

William H. Snyder, Jr., M.D., *Hollywood*

SUMMARY

On the basis of statistics, total thymectomy should be considered for the treatment of myasthenia gravis if the disease is severe and response to well regulated medical management is unsatisfactory. That improvement follows the operation in many cases, particularly if symptoms are of recent development, is indicated by reports in the literature. Of two patients operated upon by the author, one whose symptoms were of short duration was benefited objectively and subjectively; the other, in whom symptoms had existed seven years, said she felt better but there was no objective evidence of improvement. Patients should be told beforehand of the operative risks involved and the uncertainty of prognosis following the procedure.

TOTAL thymectomy has been performed many times during the last seven years in severe cases of myasthenia gravis which have been resistant to the best of medical management. It is for the few seriously afflicted patients whose response to prostigmine and other medical therapy is poor that operation is to be considered. In a series of 20 patients upon whom complete thymectomy was performed by Blalock[2] and in another series of 60 operated upon by Keynes[4] the mortality rate was approximately 20 per cent and the rate of cure approximately 50 per cent. These facts were explained to the author's patients, and two of them who were not doing well on medical management elected operation. These two cases will be reported in this presentation, with special reference to the surgical management of this condition.

DIAGNOSIS AND MEDICAL MANAGEMENT

Recognition of myasthenia gravis depends upon the symptoms and signs associated with weakness of the muscles of the eye, larynx, pharynx, jaws, face and extremities. These may begin insidiously or abruptly and at any age. One of our patients was 21, the other 19. In one the symptoms had been present for seven years, in the other for four months. Fatigue takes place rapidly in the muscles involved. It is lessened by rest and by prostigmine. This drug introduced by Remen[5] and popularized by Walker[8] is so specific in myasthenia gravis that the response to its administration is diagnostic of the condition (Viets[7]).

The optimum dosage varies. In one of our cases it was 120 mg. of prostigmine bromide daily and in the other 250 mg. Other drugs such as ephedrine sulfate, potassium chloride and guanidine hydrochloride have not been used. As the proper medical management is in the province of the internist and general practitioner it will be discussed herein no further.

INDICATIONS FOR OPERATION

The development of total thymectomy for myasthenia gravis began with Blalock[3] about seven years ago. He recognized the frequent occurrence of thymic tumors with myasthenia gravis and he furthermore reasoned that, even when no tumor existed, removal of the thymus might be effective. The validity of this assumption has been borne out in about 50 per cent of the several series aggregating 80 cases (Table 1) of total thymectomy. In nine of these cases the patient had a thymic tumor but the incidence of cure in them was no greater than in those cases in which no tumor existed. (In neither of the author's two cases was there evidence of thymoma either by x-ray previous to operation or by a pathological examination of the removed gland.) The mortality rate in the total series was approximately 20 per cent. In this connection, however, it must be recognized that the operative group included the most severely afflicted patients. Contrasting this operative group with a series of 175 patients reported by Viets which were on purely medical management, there were 14 per cent of apparently permanent cures and a mortality rate of 20 per cent over a ten-year period.

Table 1.—*Results of Thymectomy*

	Keynes	Blalock	Viets	Total
Well or greatly improved	29	8	4	41
Ill or slightly improved	12	8	4	24
Operative mortality				15

On the basis of these facts it seems reasonable to conclude that operation should not be considered except for those patients with severe myasthenia gravis who do not respond satisfactorily to a well regulated regime of medical management. Furthermore it seems wise to explain the risks and the possible benefits and allow the patient to decide whether or not he desires operation.

Duration of the myasthenic symptoms may be of some importance in the prognosis following operation. In the series of 80 cases only one of the

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patients obtaining good results had had symptoms longer than five years. One of the author's patients with symptoms existing for seven years did not show objective improvement following thymectomy. X-ray therapy has often been proposed as an alternative to the more radical surgical attack. However, almost all authorities are agreed that it is ineffective and should not be utilized.[7]

PREOPERATIVE TREATMENT

Preparation of the patient for operation includes special attention to the respiratory tract. Any history of a cold in the last few weeks is an indication for postponement. Penicillin should be given prophylactically for a few days before and continued through several days after operation. Face masks should be used by all those attending the patient. Prostigmine should be given in dosages producing maximum therapeutic effect. This means anywhere from a few tablets of 15 mg. of prostigmine bromide to 30 such tablets spaced throughout the 24 hours. In addition, 1.5 mg. of prostigmine methyl sulfate is given hypodermically just before and during and after operation until oral administration can be resumed. Determination of the patient's blood group before the operation and administration of blood during the procedure should be a part of the routine. Morphine should be limited to small doses. Atropine must be used more frequently than in other operations, both because of the heightened secretions and because it counteracts the stimulating effect of prostigmine on smooth muscles.

SURGICAL TECHNIQUE

The operation, the technique of which was developed by Blalock and Keynes, is performed under intubation or under pressure anesthetic. Ether is safe and satisfactory. Only a very little, 1 to 2 ounces, was necessary in our two operations. A low thyroid incision (Figure 1) was made. This was joined in the center by a longitudinal incision over the sternum extending down to the fourth interspace. The neck dissection was then developed so that the lower poles of the thyroid were exposed. Just below these the upper lobe of the thymus was visible. (In one of our cases the right lobe of the thymus extended up into the neck well beyond the level of the thyroid cartilage. Ordinarily it ends at

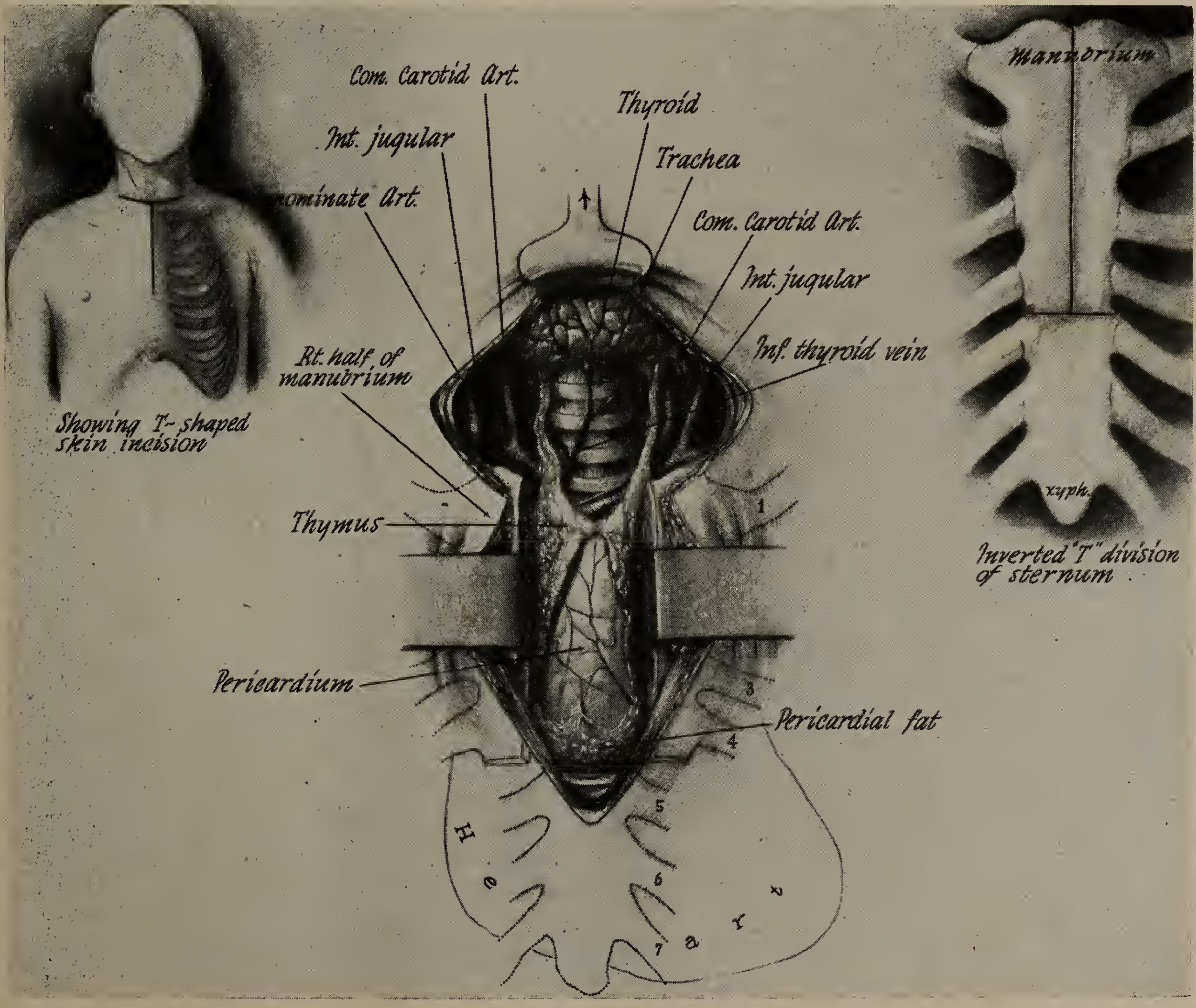

Figure 1

the thyroid.) The neck dissection completed, a finger was inserted as far as possible beneath the jugular notch on the posterior surface of the sternum separating the pleura in the midline. The sternum was then split for a short distance. (This may be done with a Schumacher rib cutter or with a Lebsche sternum splitter.) The edges of the sternum were then separated with retractors and further finger dissection of the pleura from the posterior surface of the sternum was easily accomplished. The process was continued to the fourth interspace at which level two outward cuts were made in the two longitudinal halves of the sternum and these were separated. This exposed the thymus gland completely. (It can usually be identified by following the upper exposed lobes downward and separating the pleura from its anterior surface.) The lobes were separated from the fatty tissue covering the pericardium. All the small arteries to the thymus gland were carefully ligated as a precaution against postoperative mediastinal hemorrhage, one of the most difficult complications to control. The main tributary vein from the thymus, which joins the left innominate, was carefully isolated and tied. After the completion of the removal of the gland, several strips of Gelfoam were applied to areas where there was a general ooze. Another method that has been used to control the bleeding from the raw surfaces of the mediastinum is the insertion of a ureteral catheter and frequent aspiration, as suggestion by Ralph Adams,[8] but this was not found necessary. We used a Penrose drain brought out through the incision in the neck, feeling that this was a worthwhile safety measure.

In closing the wound, the halves of the sternum were brought together with two or three heavy silk sutures passed completely around the bone and tied on the anterior surface. Fascia overlying the sternum was then closed with interrupted fine silk. Time required for the entire procedure was from one and one-half to two hours. Both patients stood the procedure well.

Immediately following, the trachea was thoroughly aspirated. The patient in each case was given 1.5 mg. of methyl prostigmine hypodermically. This was continued every two to three hours until he could take the prostigmine by mouth. An oxygen tent was provided. Penicillin was administered in full dosages. The patient was allowed fluids by mouth as soon as they were tolerated. Using a portable machine, roentgenograms of the chest were taken on the first and second days postoperatively to determine the size of the mediastinum. Ambulation was allowed early despite the division of the sternum. The oral administration of prostigmine bromide was adjusted to accord with the patient's needs.

CASE REPORT

The patient, 19 years of age, was admitted to the Los Angeles County Hospital because of weakness of the muscles of the extremities. Four months previously profound weakness of the muscles of the arms had developed following a respiratory infection so that the patient had to remain in bed for several weeks. Two months before hospitalization the condition was diagnosed as myasthenia gravis. By this time the patient was able to be up only a little while each day. In addition to the weakness of the extremities there was diplopia, some difficulty in swallowing and weakness of the facial muscles. All symptoms and signs regressed with the giving of prostigmine bromide (15 mg. divided into ten doses daily) but even when the dose was doubled the patient was still unable to work and had to be in bed a good part of each day. After preliminary rest and regulation of the prostigmine therapy in the hospital, the patient was prepared for thymectomy, which he elected after the risk of the procedure and the prognosis after operation were explained. A preliminary tonsillectomy was performed because of badly infected tonsils. Three weeks later a thymectomy was done, using the previously described technique.

The thymus gland measured about 20 cm. in length and weighed 28 gm. Neither the gross appearance nor microscopic appearance was remarkable.

Postoperatively 1.5 mg. of prostigmine methyl sulfate was given hypodermically about every hour for the first 48 hours. Gradually the frequency of administration was reduced and the patient was placed on the previous preoperative dose of prostigmine bromide by mouth. Penicillin was administered in large dosages. On the fifth day postoperatively the patient experienced considerable difficulty in breathing and the wound was opened but no clot or hematoma found. Gradually his condition improved. Except for a low-grade infection following the secondary surgical procedure recovery was uneventful. At the time of discharge, prostigmine, to be taken in doses of 1.5 mg. six times daily, was prescribed. When examined five months later, he was feeling better than at any time since the onset of the disease, was back at work and was taking only three doses of prostigmine daily on occasion. In weight and strength he had returned to normal.

RESULTS

It is not possible to draw any conclusions from experience in two cases. One patient had had symptoms for seven years. There has been no objective improvement since the operation, but subjectively she seems to have been benefited, as she persistently states that she feels stronger. Further observation will be necessary before any final statement is made about this case. However, at the present writing it is not felt that the operation has been of any real benefit.

The second patient had had symptoms for only four months. He was unable to be up more than part of the day in spite of maximum dosages of prostigmine. Following total thymectomy he has been quite active all day while receiving only one-half the preoperative dose of prostigmine. It is believed that in this case there was real improvement following operation. In view of the results reported in the literature and actual experience with two cases here recorded, it seems reasonable to conclude that it is worthwhile offering total thymectomy to those patients with severe myasthenia who do not respond satisfactorily to the best of medical management. Furthermore the operations demonstrated to the author's satisfaction that the procedure of total thymectomy can be completed without mishap if adequate amounts of prostigmine are given before, during and after operation, if light pressure anesthesia is given, and if the technique developed by Blalock and Keynes and here presented is carefully followed.

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Superficial Epithelioma of the Covered Parts of the Body

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SUMMARY

In individuals with primary cutaneous epithelioma there may be a widespread predisposition of the basal cell layer of the epidermis toward the production of growths of this type. The differential diagnosis usually can be made on clinical characteristics, but in some instances differentiation is difficult and a correct diagnosis may be reached only by microscopic examination of the tissue.

The radioresistance of this type of epithelioma is emphasized and the selection of the proper method of treatment is discussed.

Consideration of the factors of (1) size and location of the lesion, (2) age, and (3) general condition of the patient may result in a decision that, in some cases, no treatment is indicated. Biochemical, cytological and pathological studies of basal cell epithelioma might lead to a clearer understanding of the nature of epitheliomas in general.

BASAL cell epithelioma is a common skin neoplasm usually on the face and neck and occasionally on the covered parts of the body. Various kinds are recognized, such as the rodent ulcer, nodular, cystic, sclerosing, morphea-like, pigmented, and the superficial type. This paper will be confined to a discussion of the superficial variety.

Primary cutaneous carcinomas are classified by MacLeod and Muende[6] as follows:

1. Basal cell—rodent ulcer group.
2. Prickle cell.
3. Mixed, metatypical or baso-squamous cell.
4. Intra-epidermal.

I. *Clinical Characteristics of Superficial Basal Cell Epithelioma*

Superficial basal cell epitheliomas occur most often on the trunk, arms, and thighs. They are usually multiple, as many as 200 lesions having been reported in a single case. The lesion appears as a superficial, dry, erythematous scaling plaque with a sharply defined, slightly elevated, threadlike waxy edge (Figure 1). They vary in size from a few millimeters in diameter to 30 cm. or more, and are usually oval or circinate in form. A tendency toward healing in the center is often noted. In addition to superficial basal cell epitheliomas, other types of superficial carcinomas are recognized, namely, Paget's disease of the nipple, Bowen's squamous cell epithelioma in situ, and the baso-squamous type.

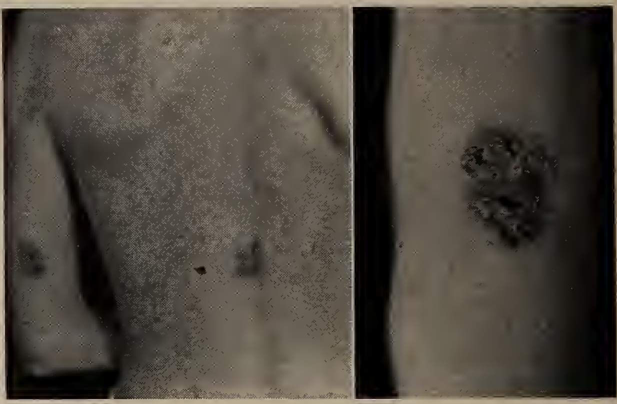

Figure 1.—Typical superficial basal cell epithelioma. Left, arm and back; right, close-up of arm lesion.

II. *Incidence*

In a recent analysis of a large series of cutaneous lesions, Sutton[13] found an incidence of 2.07 per cent of the superficial type of carcinoma. It is of interest to note that in his series of 560 cases, 95 per cent of the patients had basal cell epitheliomas on the head and neck and 3 per cent had lesions on the trunk. Tables 1 and 2 show the incidence and distribution of lesions found in the University of California Visible Tumor Clinic during the past ten years. It is noted that in this series of 487 basal cell lesions, 1.64 per cent were of the superficial or "body basal" variety. Basal cell epitheliomas of all types occurring on the trunk constituted 22 or 4.5 per cent of the total. Multiple lesions were present in 75 per cent of the cases. Seven of the eight patients treated by the author were females. Little[4] also found a preponderance of lesions in the females.

III. *Nomenclature*

Various terms have been employed to designate this group of superficial neoplasms. Little[4] described them as "erythematoid benign epitheliomas." Wise[14] preferred to call them "multiple superficial benign epitheliomas of the trunk." Other designations given the growths by various writers include: carcinoid of the skin, Bowen type epithelioma, Pagetoid epithelioma, and carcinoma cutis multiformis. The entire subject was greatly clarified in an excellent report by Montgomery[10] in 1929. He chose the term superficial epitheliomatosis and included under it, basal cell, squamous cell. and

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baso-squamous or mixed cell intra-epidermal epitheliomas. Andrews[2] described them as intra-epidermal and multicentric epitheliomas.

Inasmuch as the large majority of these superficial epitheliomas are of the basal cell type rather than squamous cell or mixed, most of the present discussion will concern the former. However, it must be emphasized that although the intra-epidermal squamous cell tumors constitute the minority, the danger of them to the individual is potentially the greatest by virtue of their capacity for metastasis. Conversely, the body basal cell type is extremely slow-growing, rarely ulcerates, and probably never metastasizes or results in death of the individual. Certain clinical and histopathological features render the intra-epidermal and multicentric basal cell tumors analogous to other basal cell epitheliomas, and for this reason it is deemed better to designate them as such.

IV. *Etiology*

These relatively benign epitheliomas originate in apparently normal skin and are not preceded by nevi, verrucae, keratoses or other possible precancerous conditions. Many of the patients who have such lesions also have one or more ordinary basal or squamous cell epitheliomas, especially on the head and neck, at some time during their life. Some writers favor a theory of congenital predisposition and classify the condition among the nevoid dermatoses.[14] Anderson[1] is of the opinion that arsenic is the causative agent in the majority if not all cases of this condition. He has presented a convincing study to show that a history of the ingestion of arsenic can usually be elicited from these patients and he demonstrated the presence of

TABLE 2.—*Analysis of Cases of the University of California Visible Tumor Clinic*

Number of cases of basal cell epithelioma	487	
Number of cases of basal cell epithelioma on the trunk (all types)	22	4. 5%
Males	10	
Females	12	
Number of cases of superficial basal cell epitheliomas	8	1.64%
Location of lesions:		
Interscapular	2	
Scapular	4	
Anterior chest	1	
Upper arm	3	
Hip	1	
Abdomen	3	
Lower back	2	
Thigh	1	
Inguinal	1	
Cases with multiple lesions	6	
Cases with single lesions	2	
Other types of epithelioma in patient	3	
History of arsenic ingestion	3	

TABLE 1.

Case No.	*Sex & Age*	*No. of Lesions*	*Location of Lesions*	*Duration of Lesions*	*Other Types of Epith. in patient*	*History of Arsenic*	*Histopath.*
1.	F65	2	Interscapular Scapular	5 years	Multi-epith. squam. and basal on face and neck	Potarsenite Sod. caco. 1917	Multicentric basal cell epithelioma
2.	F72	5	Lower back Buttocks Abdomen Upper arm	15 to 20 years	Epith. squam. of tongue		Multicentric basal cell epith. and mixed intra-epidermal sq. cell epith.
3.	M55	5	Ant. chest Upper arms Abdomen Thigh	20 years		Fowler's solution for 2 yrs. at age 35 for psoriasis	Multicentric and intra-epidermal basal cell epith.
4.	F49	12	Scapular Inguinal Abdomen Ant. chest	3 years		Urine determination + for As in Feb., 1942	Multicentric basal cell epith.
5.	F84	1	Scapular	4 years			Multicentric basal cell epith.
6.	F63	1	Scapular	2 years			Multicentric basal cell epith.
7.	F69	3	Lower neck Interscapular Lower back	3 years	Post-auricular epith. basal. Ca cervix	Psoriasis for years. No history of As	Neck and post auric. epith. basal. Back lesions. Multicentric epith. basal
8.	F63	2	Upper arm Ant. ankle	20 years 5 years		Fowler's solution for 5 yrs. at age 23 for "nerves"	Multicentric basal cell epith. (arm). Intra - epidermal squam. cell epi. ankle

abnormal amounts of the element in the lesions of patients he treated. Furthermore, in addition to the presence of superficial epitheliomas on the trunk, some of his patients presented typical arsenical keratoses elsewhere. No attempt was made in the cases treated by the author to demonstrate the presence of arsenic in the tissues, blood, or urine.

Piper[12] expressed the belief that the relative frequency of this type of epithelioma in psoriasis is due to chronic irritation which stimulates growth of the inherent germ anlage. He felt that tar medications, roentgen-ray treatment, and arsenicals might be causative factors, but at the same time he conceded that the correlation might be purely coincidental.

Montgomery[11] offered the opinion that arsenic may accelerate latent or dormant cutaneous malignant foci of the skin. He believed that individual sensitivity or susceptibility to arsenic must be considered.

Johnson[3] recently emphasized the fact that the type of carcinoma occurring on the covered parts of the body differs from that on the exposed parts. It would seem that the protection afforded the skin by clothing may in some way affect or influence the development and character of these epitheliomas. Actinic rays, wind and weather are apparently not factors as in the case of carcinomas developing in exposed skin, nor does trauma appear to bear any relationship to their origin.

V. *Histopathology*

All types of cutaneous epitheliomas commence intra-epidermally, and in typical intra-epidermal cancers the basal cells proliferate upwards and sideways into the prickle cell layer. The rete pegs are thereby broadened and the thickness of the epidermis is increased. In the early stages the basal cell layer remains intact, but later the basal cells grow as solid masses into the upper cutis or assume an alveolar pattern to simulate one of the skin appendages. Often there are multiple points of origin for these masses in the epidermis, and such lesions have been designated multicentric basal cell epitheliomas (Figure 2). Mitotic figures are present but seldom numerous. There is usually a slight plasma cell and lymphocytic infiltration in the upper cutis. At times there is a tendency for fibrous tissue to encapsulate the growths. Madsen[7, 8] concluded that the tumor starts at a central point from which it spreads continuously in a radial pattern along the interpapillary processes of the epidermis. From a study of horizontal serial sections on 18 cases, he concluded that the epitheliomas are unicentric—there being no evidence that the tumor at onset has not consisted of one epithelioma located in some point in the interpapillary processes. Other writers, notably Montgomery and Wise[10, 14] have shown multiple points of origin from the basal cells of the epidermis. Less often the nests of abnormally proliferating cells are of prickle cell (Figure 3) or baso-squamous cell origin, in which instances the growth may terminate as a squamous cell epithelioma.

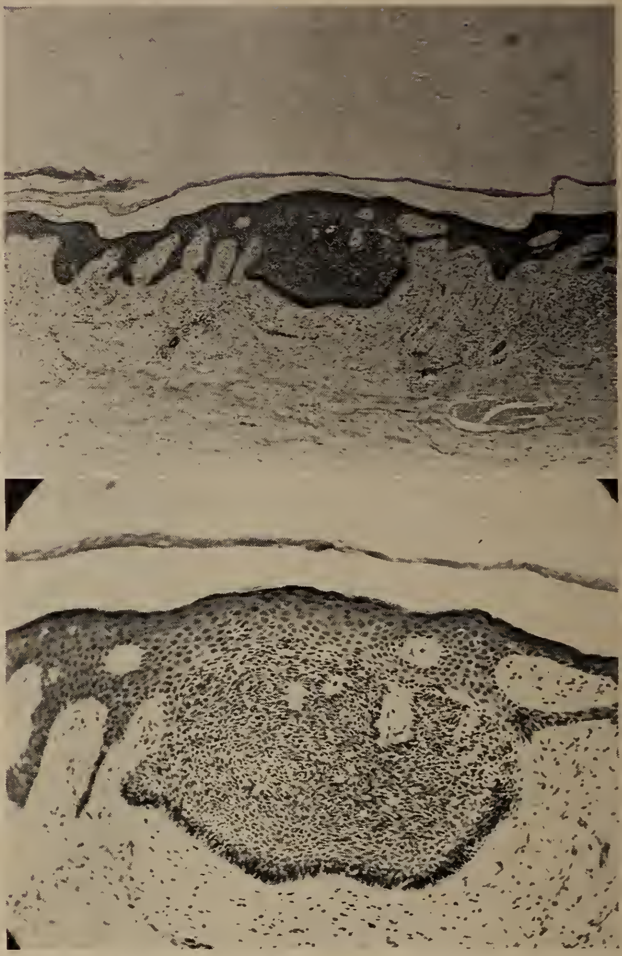

Figure 2.—Photomicrograph of multicentric basal cell epithelioma. Top, lower power; bottom, high power.

In all eight cases in the author's series the lesions were multicentric in pattern; one patient (Case 2 in Table 1), in addition, had mixed and intra-epidermal squamous cell involvement; two patients (No. 3 and No. 8) had intra-epidermal basal cell and squamous cell activity, respectively. It was observed that the various types of tumor cell activity, that is, multicentric, intra-epidermal basal or squamous cell, and mixed cell may occur alone in different lesions on the same patient, or, in some instances, may be combined in the same histopathological section.

VI. *Diagnosis*

The differential diagnosis includes psoriasis, chronic discoid lupus erythematosus, late syphilis of the skin, eczematoid dermatoses, chronic granulomas, superficial and deep fungus infections of the skin, keratoses, epitheliomas secondary to other causes (such as radiodermatitis), or xeroderma pigmentosa, and intra-epidermal squamous cell epitheliomas (such as Paget's disease of the nipple), and Bowen's squamous cell epithelioma. The intra-epidermal squamous cell lesions frequently are moist and eczematous but not invariably so. One of our

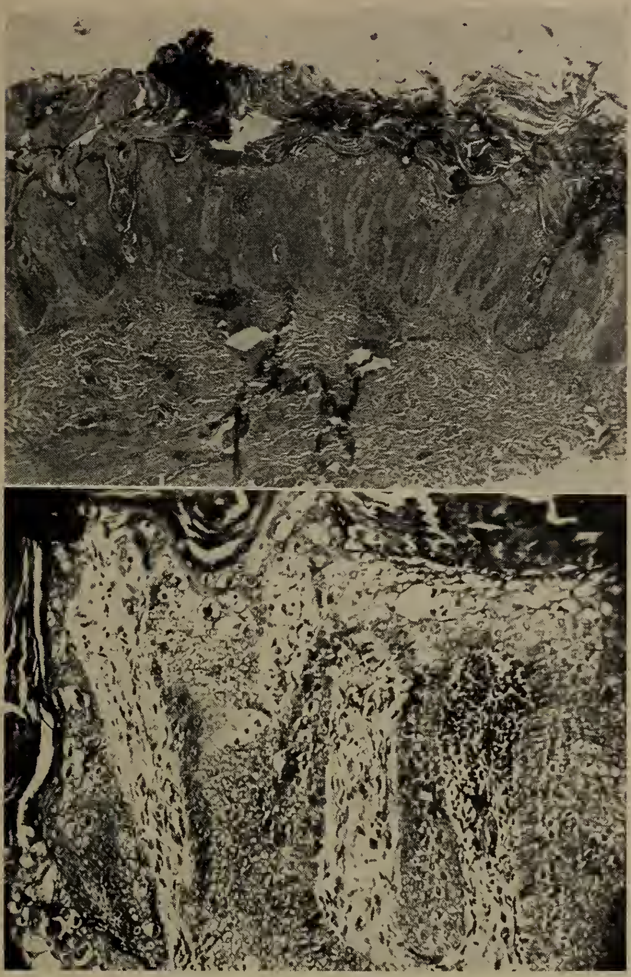

Figure 3.—Photomicrograph of intra-epidermal squamous cell epithelioma. Top, low power; bottom, high power.

patients (Case 8) had a lesion on the ankle of five years' duration which clinically suggested superficial basal cell epithelioma. Histopathologic study revealed a typical intra-epidermal squamous cell epithelioma (Figure 3).

The conditions noted in the preceding paragraph are usually readily distinguished and the lack of the typical threadlike border in all of them is a valuable diagnostic point. At times, psoriasis may be difficult to differentiate from superficial epithelioma especially when the two coexist. In this instance, as well as in the case of intra-epidermal squamous or mixed cell epithelioma, microscopic examination of the tissue is essential for a correct diagnosis, since clinically they may be identical.

VII. *Treatment*

Four different methods of treatment are available, namely: (1) electrosurgical; (2) surgical; (3) irradiation; (4) chemosurgical.

1. *Electrosurgical:* For the majority of lesions, this is perhaps the method of choice. The author's experience has been limited to the use of the curette, fulguration and desiccation. For small lesions, this has been a satisfactory method except in the sternal area where in one instance delayed healing was encountered. The cosmetic result from this type of therapy is usually excellent.

2. *Surgical excision:* This method is preferable for large lesions. Also, in the case of certain lesions occurring on the anterior chest (sternal area), the most satisfactory results are achieved by this approach. In some instances, a skin graft is necessary to cover the defect.

3. *Irradiation:* Included here are x-ray, radium and radioactive elements, such as P_{32} (radioactive phosphorus). The cells producing these growths are highly differentiated and this would seem to account for their apparent radioresistance. This fact, together with the tendency for the lesions to attain a large size, indicates that this type of epithelioma does not lend itself well to irradiation therapy. The author's experience confirms the conclusions, reached by other observers, that undesirable late radiation effects may result if a dosage sufficient to eliminate the growth is given. Low-Beer[5] has shown that the biological depth effect on the skin of beta radiation from externally applied P_{32} during the acute phase (bullous epidermolysis) of the reaction, extends to 5 mm. In the late phase (215th day) the reaction was detectable to a depth of 2 mm. Inasmuch as strands of tumor cells may extend beyond this depth, and considering the mature type of cell involved, this method is not believed to be generally desirable.

4. *Chemosurgical:* In the past, trichloracetic acid combined with curettage has been employed with success. However, the results of the method are uncertain and it is not suitable for large lesions. It is possible that these tumors would lend themselves well to treatment by the method advocated by Mohs.[9] This method is a combination of chemical fixation of the tissue in vivo and surgical excision. The entire technique is controlled by histopathological examination of all excised tissue, thereby insuring that all of the tumor and its ramifications are removed. So far as is known, superficial epitheliomas have not as yet been treated in this manner.

VIII. *Discussion*

Treatment failures have resulted from electrosurgical, surgical, and irradiation methods. Not all such failures can be attributed to the allowance of an inadequate margin surrounding the lesions, or to insufficient depth of destruction or removal. It is believed that the tendency toward the development of these epitheliomas may be widespread in certain individuals, and that since incipient lesions are only microscopically detectable, some "recurrences" are actually new lesions not previously clinically apparent. In many instances a cure can be effected by complete removal of the tumor with an adequate margin of surrounding normal tissue. A microscopically controlled technique should prove of great value in this respect and further studies should be made utilizing such a method.

The multicentric origin of many of these lesions seems to indicate a widespread predisposition on the part of the epidermis to proliferate in this manner in some individuals.

Experience in one case (No. 4 in Table 1) well illustrates this tendency. Approximately one year after the excision of a large lesion on the upper back, just to the left of the mid-line, a new lesion appeared about 4 cm. below the tip of the scar. This was not considered to be a recurrence. An area of normal appearing skin on the left lower back was chosen for biopsy. The area chosen was approximately 10 cm. from any previously involved skin. Histopathological study of the tissue showed a definitely abnormal character of the basal cell layer. The lack of uniformity of the cells and their tendency toward uncontrolled proliferation were apparent (Figure 4). The observation of persons who produce large numbers of basal cell epitheliomas would also indicate that a constitutional tendency may be present.

It is not believed that the ingestion of arsenic can account for the development of these lesions in all individuals. None of the eight patients in the author's series presented keratoses, pigmentation or other objective evidence of previous arsenic ingestion. However, as several had a history of prolonged ingestion of Fowler's solution, the possibility occurs that some patients who received arsenic internally for psoriasis in years past might actually have had superficial epitheliomas initially rather than psoriasis.

It does seem that a step might be made toward a clearer understanding of epithelial neoplasms in general by exhaustive cytological, pathological and biochemical studies of this type of skin tumor. Here are epithelial cells, not entirely malignant but more or less attenuated, whose growth processes might

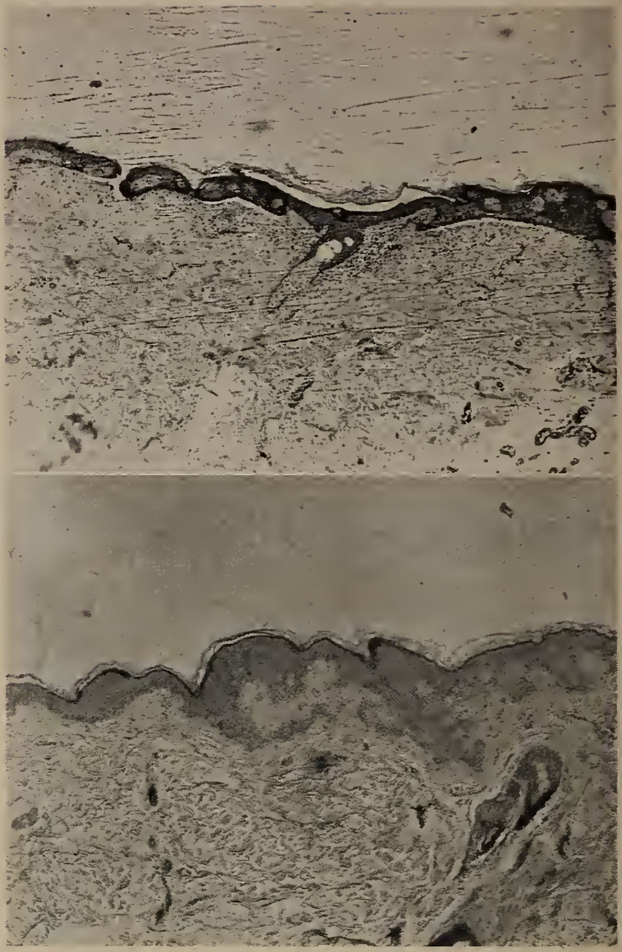

Figure 4.—Photomicrographs of grossly normal skin in vicinity of superficial basal cell epitheliomas. Top, Case 7 in Chart 1; bottom, Case 5.

TABLE 3.

Case	*X-Ray*	*P_{32}*	*Curette and Desiccation*	*Excision*
1.	None	None	Feb. 1940. Recurved at edge of scar. May 1941: C & D repeated. No recurrence after 7 years	None
2.	None	None	All treated with satisfactory result after 1 year	None
3.	5,100 r—right arm lesion, 1943. Now marked telangiectasia and atrophy	Equiv. 2,000 r to lesion on left chest. Failed to respond in 6 months	Ant. chest. 1943. Failed to heal in 6 months.	Previously treated ant. chest lesion excised and grafted with satisfactory result after 1 year
4.	1939-40. L. scapular lesion failed to respond. Dosage not known		1944. 2 back and 2 chest lesions. 1944: L. scapular lesion recurred in 1944. 1948: 3 small lesions on lower back	Scapular lesion excised 1944. 7 of recurrence. 1947: biopsy inconclusive. 5 or 6 new match head to pea-sized lesions on lower mid-back and flank.
5.	No treatment because of patient's age			
6.	None	None	August 1941. Good result	None
7.	None	Sept. 1944. Activity. Dec. 1946. Lesion then excised.	1943 — Recurred — lesion then excised	1944: Excision; recurred in 1946. 1946: all excised with satisfactory results to date, Jan. 1948.
8.	No treatment as yet.			

be studied with a view to solving at least a part of the mystery of epitheliomas.

At times the very important question of the necessity for treatment must be carefully considered inasmuch as the body basal cell epithelioma is relatively benign. Advanced age and poor general health of the patient, together with the size and location of the lesions in certain instances, might result in a decision that no treatment is indicated.

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Discussion by L. H. Winer, M.D., *Beverly Hills*

There is so little to add to Dr. Harding's presentation that I may be forgiven for reemphasizing some of the points he has made.

Intra-epidermal prickle cell carcinoma and superficial basal cell epitheliomatosis are clinically similar in that they involve the same sites. They have a prolonged course of years without change of appearance. They are superficial plaques and show very slight tendency to ulcerate.

Bowen's disease and intra-epidermal squamous cell carcinoma show definite histologic characteristics. These are: (1) flattening of the basal cells; (2) the presence of irregular asymmetric mitotic figures; (3) individual cell keratinization, and (4) "Bowen's cell" with its amitotic, irregular clumped nucleus and wide bordered cytoplasm. The superficial basal cell epithelioma has the following histologic characteristics: (1) there are multicentric areas of proliferation of mature basal cells, some of which are cuboidal and others spindle-shaped; (2) these proliferating basal cells contain larger darker nuclei than the normal basal cells; (3) prickles are absent between the cells; (4) a few mitotic figures are present; (5) there is complete absence of amitotic figures.

As is the case in any tumor, the composition cannot be known unless histologic examination is performed. Occasionally a clinically diagnosed basal cell carcinoma turns out to be a squamous cell carcinoma histologically. In like manner, a clinical superficial basal cell epithelioma has been diagnosed intra-epidermal prickle cell carcinoma histologically. This was the situation in Case 8 in Dr. Harding's paper. There have been cases of intra-epidermal basal and intra-epidermal squamous (prickle) cell carcinoma side by side in the same section of tissue. This has been observed similarly in a section of basosquamous cell carcinoma. These intra-epidermal lesions may be name intra-epidermal basosquamous cell carcinoma.

The frequency with which arsenical ingestion is associated with subsequent occurrence of superficial epitheliomatosis is more than a coincidence. The stimulating effect of arsenic on the epidermis is observed frequently. It is readily conceivable that hyperplasia may progress to neoplasia which is then an irreversible process.

The "so-called recurrence" in the author's Case 4 certainly emphasizes the multicentric origin of these lesions. It is probably based on the multiple areas of sensitization to carcinogenic stimuli in the epidermis. It may also be due to embryonic structural rests which suddenly begin to proliferate and recapitulate in a disorderly manner. This results in the formation of an epidermal neoplasm of indeterminate origin.

Some observers claim that superficial basal cell epithelioma is relatively benign. The intra-epidermal prickle (squamous) cell carcinoma is a malignant lesion. It eventually breaks through the epidermis and metastasizes. Therefore, only by histologic examination can one conscientiously give proper treatment and prognosis.

We can only theorize why superficial basal cell epitheliomas occur on the covered skin of the body. Anatomically, the epidermal ridges and the follicle apparatus are quite superficial in these areas. Some of these lesions histologically do resemble embryonic hair follicle buds, as proposed by Foot in his studies of adnexal carcinoma of the skin.

I agree with Dr. Harding's treatment of these lesions—destruction by whatever modality fits the particular case best.

Radioresistance, as regards roentgen ray therapy, I think has been over-emphasized. Failures of cure in superficial basal cell epithelioma following this form of therapy may be recurrences, resulting in the manner mentioned in Case 4 following excision. Mohs' work has shown that recurrence is most frequently due to incomplete removal or to too shallow or too narrow an area of treatment, rather than to radioresistance of the tissue.

The Obstetrician's Responsibility in Infant Mortality

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SUMMARY

Although infant mortality has been remarkably reduced, stillbirth and neonatal death rates have been improved very little. Efforts at lowering the fetal death rate must be directed to those conditions affecting the fetus during labor or immediately afterward.

Prevention of premature labor and better care of the premature infant during labor and the neonatal period offer hope of a greater salvage of premature infants. Proper environment and trained personnel are necessary.

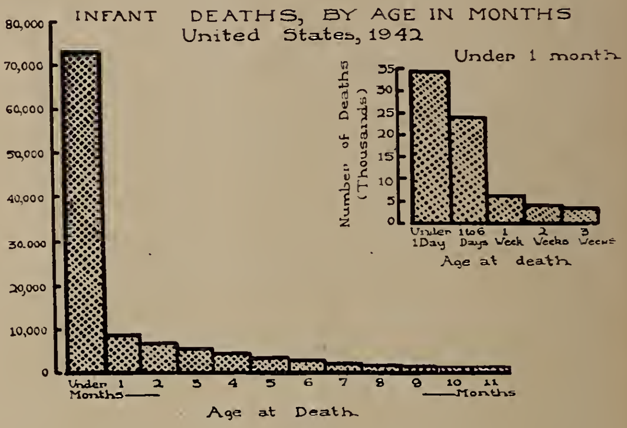
Spontaneous delivery is safest for the infant. Difficult operative procedures are associated with a high incidence of birth trauma, asphyxia and death.

Since asphyxia is one of the chief causes of infant death, prevention, diagnosis and treatment of it are most important. Administration of oxygen to mildly asphyxiated infants before the injury has become irreversible may help to prevent late manifestations of anopia.

During the past decade, statistics from the United States Bureau of the Census have shown considerable improvement in maternal and infant mortality, although less as to infants than mothers. Between 1933 and 1943 the maternal mortality declined 60 per cent.[4] During the same period deaths of infants (under 1 year of age) decreased from 58.1 per 1,000 live births, to 40.4, a decrease of 31 per cent. This was further reduced to 38.3 in 1945[13]—quite a contrast to a rate of 99.9 in 1915. This gratifying picture can be further improved.

The reduction in infant mortality has not been equal in all age groups. This is shown in the accompanying graph of statistics for the year 1942. The rates of decline vary inversely with the age, the greatest number of deaths occurring during the first month of life, and most of these in the first day.

In 1943, 60 per cent of the infant deaths were due to prenatal or natal causes; in 1944, 61 per cent. Neonatal mortality was regarded as perhaps the most important subject discussed at the recent International Congress in Dublin, indicating the importance of fetal mortality.[14]



Prematurity is by far the leading cause of infant mortality.[4] In 1944, 30 per cent of infant deaths in the United States were ascribed to premature births; in 1943, 29 per cent. Premature birth, congenital malformations, birth trauma and congenital debility are the more outstanding prenatal and natal causes accounting for 54 per cent of all infant deaths in 1944 and 53 per cent in 1943. Although there is considerable difference in infant mortality among races, that feature will not enter into this discussion.

To improve the present mortality rate our efforts and attention must first be directed to saving those infants lost during the prenatal and neonatal period. Prenatal care, management of labor and delivery, and initiation of respiration immediately after birth are all important factors in life for the full term as well as for the premature infant. The responsibility for this early care must be assumed by the obstetrician. Beck[1] in his study of infant mortality has emphasized the obstetrician's responsibility for the hazards of the first few days of life.

In premature infants the vital organs are insufficiently developed to carry on the functions necessary to maintain life. Increased efforts must be made to give prematures careful and intelligent attention after delivery. The best environment possible must be supplied under adequate supervision by specially trained personnel.

Increased efforts must be made to prevent premature delivery. Mauzey[7] reports the probable causes of prematurity were chiefly eclamptogenic toxemia, premature detachment of the placenta, syphilis, multiple pregnancy, habitual abortion, placenta previa, nephritic toxemia, heart disease and pyelitis. More complete prenatal care and institution of proper treatment offer hope of greater fetal salvage in these as well as other causes of premature delivery. The induction of labor and cesarean sec-

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tion for nonmedical reasons, except in definitely mature infants, should be discouraged. Whenever feasible, maternal complications of the prenatal period, which are associated with a high incidence of premature labor, should be treated conservatively as long as the delay does not create a serious hazard to the mother.

Since the premature infant is more susceptible to injury than the full term infant, oxytocic substances should be avoided in order to prevent rapid and precipitate labor. The membranes should be preserved until full dilatation of the cervix occurs. Heavy sedation is to be avoided in premature labor. Immediately after delivery the respiratory passages must be cleared by aspiration and energetic efforts made to start the infant breathing at once. The most common causes of death during the neonatal period, among both premature and full term infants, are pulmonary lesions such as atelectasis, massive aspiration and pneumonia. While some cells from the amniotic fluid are to be found in the respiratory passages without significance, aspiration of large amounts of amniotic fluid may occur before delivery and produce very distinct symptoms. Labate[5] found in his series that aspiration of foodstuff was a common cause of pneumonia. This is a preventable cause of death and can be greatly reduced by proper care and properly trained attendants.

Birth injury stands high as a cause of fetal death. The premature infant is especially liable to injury. Because of the possibility of trauma, delivery by high forceps and other difficult means carries a heavy risk for the infant. Even in cesarean section there is risk of fatal injury of the infant. The lowest rate of infant loss is in those delivered spontaneously. Deaths due to birth injury are reported to have accounted for 9.2 per cent of all deaths of infants in the United States for 1944. D'Esopo and Marchetti[2] in their study ascribed 11.5 per cent to this cause, while Potter and Adair[8] reported 13 per cent. Rapid expulsive contractions with a short labor predispose to trauma, particularly in prematures, even though the actual delivery be spontaneous.

PROLONGED LABOR INCREASES DEATHS

It is generally known that the infant death rate is directly proportional to the length of labor. D'Esopo and Marchetti[2] found that in labors over 30 hours the fetal death rate was doubled. In any prolonged labor consultation is advisable unless delivery seems close at hand.

Asphyxia, or anoxia, is often given as the cause of death. Hypoxemia[11] and transnatal asphyxia and anoxia[6] are other terms that have been used to describe this condition. Anoxia may be related to a number of factors such as birth trauma, cord complications, premature separation of the placenta, heavy sedation and anesthesia. D'Esopo and Marchetti[2] found in nearly 20 per cent of their cases that infant deaths were ascribed to asphyxia; Potter and Adair[8] reported 28 per cent. Many of such deaths occur before or during delivery, resulting in stillbirths. The deaths are rarely due to diseases which are intrinsic in the fetus. Interference with intra-uterine circulation caused by prolapse of the cord or tight cord about the neck of the fetus is responsible for asphyxia in many cases. Intrapartum bleeding from premature detachment of the placenta, or from placenta previa, may interfere sufficiently with the oxygen exchange to produce death from asphyxia. A less acute condition such as the so-called infarcted placenta may cut down the nourishment as well as the oxygen supply to the fetus, resulting in a poorly nourished anoxic infant which may be lost immediately or not survive the neonatal period.

In cases of anoxia the unwise use of anesthetics or sedatives may produce additional risk to the already distressed infant. These agents have little effect until after delivery, when they act as respiratory depressants, especially in the premature.

EFFECT OF ANOXIA ON CHILD DEVELOPMENT

Even though the immediate danger to the infant from anoxia may have passed, the more remote and late effects of such a state of oxygen want may produce serious handicaps to the child. Many authors have brought this to attention. The experimental work of Windle[12] on animal fetuses subjected to low oxygen tension is most convincing. His motion pictures of such animals showed poorly coordinated movements and symptoms of damage to the higher nerve centers. Autopsy disclosed varying degrees of damage to the central nervous system, depending on the degree of anoxia. Several workers have demonstrated what are probably the late effects of low oxygen tensions on children suffering from difficult psychological problems. Preston[9] studied the effect of anoxia on the subsequent behavior of children. More than one-fourth were of subnormal intelligence. Arrest of physical, mental, nervous, emotional and personality development occurred throughout the series. Faber has also emphasized this point. Schreiber[10] had already shown the relationship between asphyxia and mental disease. These changes represent permanent damage to the central nervous cells as a result of oxygen want. A deficiency of oxygen for more than a few minutes results in irreparable damage to the nerve cells.

The diagnosis of asphyxia in the newborn offers no problem after delivery. Before delivery, a fetal pulse rate 30 or 40 beats slower than the previous basic rate is evidence of real fetal distress. This is the only reliable sign of impending danger to the fetus. Attempts at forcible delivery at this time only add to the danger of trauma and more anoxia. Administration of oxygen to the mother is an effective means of supplying oxygen to the asphyxiated fetus. In the individual case, if no improvement is noticed after a few minutes, one may assume this method is of no value.

Many observers have emphasized the importance in caring for the newborn in a state of asphyxia.

The older methods of slapping, swinging, hot and cold tubbing, are obsolete and have no place in modern methods of resuscitation. The first essential is an open and free respiratory tract. Oxygen must reach the alveoli of the infant's lungs. Even in partial or mild degrees of asphyxia, the administration of oxygen will prevent permanent damage to the nerve cells, unless the damage is sufficient to be irreversible. It is important to supply oxygen until the child has good color, breathes well and seems normal. Body heat must be maintained, especially in prematures.

Even though the pediatrician ultimately takes care of the newborn, proper nutrition and hygiene of the mother during the prenatal period, expert management of labor and delivery, and the institution of well established respiration are responsibilities of the obstetrician. He must deliver the infant to the pediatrician in the best condition possible.

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Persistent Self-Mutilation Following Surgical Procedures

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SUMMARY

Conscious and unconscious need for continued punishment may complicate the postoperative course of surgical procedures if the patient seeks to satisfy that need by preventing the healing of the operative wound. Recognition of the underlying emotional factors is difficult, and often delay leads to chronic states of invalidism with its attendant social and economic loss.

ACTUAL or threatened self-mutilation often accounts for admission of patients into a hospital. From the viewpoint of the surgeon, the care of these patients involves no immediate technical problems other than the speedy repair of injured structures, or perhaps that intervention made necessary by more extensive internal hemorrhage. Postoperatively, the emotional reactions of these patients undergo striking changes. From the original attitude of profound depression, tension and remorse, they emerge with a light-heartedness and a gratefulness of living that is in sharp contrast to their former state of dejection. It would appear from even the most superficial questioning that the pain and inconvenience suffered were in payment of a hostile and aggressive thought or act. The diagnosis of reactive depression in a hysterical personality is therefore appended to a patient's chart to satisfy the demands of the statistical record. In no manner does such a diagnosis give an inkling as to the dynamics underlying the real motives for mutilation or attempted suicide. Menninger[4] discusses self-mutilation as focal or partial suicide and has forcefully demonstrated that the psychological motives and implications attending total self-destruction are operative in most, if not all, instances of self-mutilation.

Self-mutilation, as well as self-flagellation, serves both conscious motives and unconscious demands. On the one hand, it permits the display of aggressive tendencies and on the other hand serves as an immediate source of self-punishment and reproach. In the field of dermatology where neurotic excoriations or self-induced eruptions make up a considerable portion of practice, this dual function has been recognized for some time. Netherton[6] and, more recently, Michelson[5] and Lynch[1] have assigned as motivation for these conditions repressed internally directed rage and resentment. These authors describe two types of patients: (1) those having preexisting dermatoses who, out of habit, continuously aggravate the lesion, and (2) those who, for unconsciously determined reasons, mislead the dermatologist in his efforts and thereby prolong their pain, suffering and disfigurement. Viewed critically, this is a most equivocal separation of entities which basically have in common pain and disfigurement.

Analogies can be made between self-induced skin excoriations and scars incurred by surgical operations. However, one obvious exception is that the latter is attained with the aid of a second person; namely, the surgeon. The surgeon becomes the punitive agent who may be employed repeatedly for multiple surgical procedures in order to satisfy an almost boundless masochistic drive. These masochistic drives frequently stem from early childhood, and their source is likely to be found in the interpersonal relationships within the family constellation. Rather consistently, the parents of these patients are strict, uncompromising and punitive, and give little if any real affection. In consequence, attention or sympathetic understanding is achieved through illness or by seeking out a role for which punishment and pain are the price.

What precisely incites self-mutilation in a postoperative course is not known, but many immediate factors are assumed to be involved. One hesitates to guess as to the predictability of self-mutilation preoperatively, for even in most striking instances it is difficult enough to recognize the mutilation postoperatively. In our case material it was noted that frequent surgical experiences associated with stormy, prolonged postoperative courses suggested the hysterical type of personality with its need for masochistic satisfaction. We cannot answer with any satisfaction or accuracy why one patient had multiple operations with periods of comparative well-being, and the other undertook self-mutilation following an indicated procedure. In each of our cases the cost of hospitalization was catastrophic, and for the families involved the experience proved to be a strain emotionally and financially.

In the cases cited it is indeed difficult to distinguish which elements were consciously determined and which were attributable to unconscious material. One can be reasonably sure that in almost every neurotic reaction there is some secondary gain to the illness, and an element of malingering is therefore present. However, as pointed out by Menninger, malingering has a characteristic feature which sets it apart from other forms of self-mutilation; namely, striking directness of its aggressive purpose. He states

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further that in order to utilize the secondary gain of the illness the patient will be uncooperative with the physician whose efforts are primarily directed toward his recovery. The patient then is caught between two opposing forces that operate to his mental disadvantage and to the discomfiture of the physician.

It is hardly of academic value, then, to try to distinguish malingering from a hysterical reaction, and basically both should be considered interaction between aggression and punishment.

CASE REPORTS

Case 1. A 21-year-old female, a graduate student in bacteriology, first entered the University of California Hospital on April 2, 1937. One week before entry the patient had had a Schick test on the volar aspect of the right arm which was followed by a moderate reaction. Two days before entry she noticed that the area had become markedly reddened and painful and there were associated chills and fever. These symptoms persisted until the patient entered the hospital.

On admission, the temperature was 38.5° C., pulse rate was 100. Examination of the right arm showed a crusted central area about 1 cm. in diameter surrounded by an area of cellulitis. There was early abscess formation measuring about 8 cm. in diameter. Two days after hospitalization an incision was made and a small amount of pus and necrotic tissue removed from which hemolytic staphylococcus aureus was cultured. The patient was discharged from the hospital, improved, four days after admission.

Nine days later the patient again entered the hospital because of recurrence of the cellulitis on the right arm. On entry, the temperature was 37.5° C. There were no signs of toxicity. Despite the usual therapy the area of cellulitis increased and the patient developed a septic fever, ranging as high as 41.4° C. at the end of the first week. The area of cellulitis became indurated and localized to an area about 6 cm. in diameter. The fever persisted, however, and repeated examinations revealed no additional findings. The patient had occasional chills followed by an elevation in temperature and she continued to complain of severe headache and photophobia. Examination revealed a mild stiffness of the neck with accentuated deep reflexes equal on both sides. An atypical Babinski reflex was present on the left. The leukocyte count fluctuated from 4,500 to 13,500 with only slight increase in polymorphonuclear cells. A lumbar puncture showed a pressure of from 230 to 300 mm. of water, but the cell count, globulin, colloidal gold and Wassermann reactions were all normal. Spinal fluid sugar content was within normal limits. Repeated blood cultures showed no growth. A diagnosis of acute encephalitis was strongly considered but never proven. After being in the hospital for approximately three weeks, the patient became afebrile and was discharged entirely recovered.

The patient reentered the hospital for the third time five months later. She stated that she had accidentally cut the dorsal surface of her right forearm with a mirror which broke in her hands. The wound, which was about 5 cm. in length, had been sutured at the emergency hospital. On inspection several pieces of glass were palpated under the skin. The wound was opened and the spicules of glass were removed. Forty-eight hours later additional spicules of glass were removed. The patient developed acute cellulitis around the wound and because it was thought from her past history that she had increased susceptibility to infection, she was kept in the hospital for precautionary measures. The day before intended discharge from the hospital the patient's temperature rose to 39° C. and the pulse rate to 120, although the mild inflammatory reaction had subsided. There was crepitation about the wound extending up the forearm and the midportion of the upper arm. Smears were taken and, although no Welch's bacilli were seen, a diagnosis of anaerobic infection was made. Incisions were made into the forearm and upper arm and subsequently irrigated with Dakin's solution. Anaerobic antiserum was administered intravenously. Two weeks after the incisions were made, secondary closure was accomplished. This healed without difficulty and approximately one month after entry the patient was discharged.

She was seen again three days after discharge because of marked trismus of the jaw, stiffness of the neck and rigidity of muscles of the arms, legs and back. Motions of the neck were notably limited. A noticeable bilateral Kernig sign was demonstrated and the deep reflexes were hyperactive. There was no clonus or Babinski sign. There were definite signs of meningismus in addition to the hypertonicity of the muscles and trismus suggesting tetanus. The spinal fluid showed normal pressure; the Pandy test, cell count and gold curve were within normal limits. However, the patient was treated for tetanus. She left the hospital on the eleventh day considerably improved.

Two weeks after discharge the patient entered the hospital for the fourth time because of acute cellulitis of the right forearm and axilla. There was a tender area in the right axilla which was abscessed. On draining the abscess a spicule of glass was found in the cavity. The area of cellulitis in the forearm did not improve but seemed to remain stationary. Nine days after entry the patient had a chill and her temperature rose to 40.4° C. With the use of the usual measures, the temperature finally dropped and the patient was afebrile for about ten days. She was discharged five weeks after entry.

She returned to the hospital for her fifth entry about six weeks later, stating that the day before entry she had developed red blotches over the chest, arms and legs, and had had fever and chills. The temperature on admission was 37.6° C. There were erythematous areas over the chest, upper and lower extremities, and subcutaneous emphysema was discernible in the involved region. The patient became afebrile within 48 hours and although she had had a bout of severe enteritis for several days associated with nausea and vomiting, she was discharged from the hospital ten days after entry. The symptoms had completely disappeared within three or four days.

It was during this last entry that it was possible for the first time to break down the patient's psychological resistance. (Unsuccessful attempts had been made during previous hospital admissions.) The patient confessed that one day, while sitting at her desk in high school, she yawned and extended her arm and accidentally touched a hot steam radiator with the back of her wrist. She involuntarily withdrew her arm, but because she experienced such a pleasant sensation, she immediately placed her wrist on the radiator again. The patient also stated that during a course of anatomy she intentionally incised the back of her right wrist on two occasions because of the pleasant sensation experienced. Thereafter, whenever cellulitis subsided she would cause recurrence by vigorously massaging it. Very often this was followed by a chill and marked hyperpyrexia. She mentioned that some of the symptoms which suggested encephalitis were actually voluntarily produced and added that when she did not have fever she placed the thermometer in warm water. The laceration on the right forearm supposedly produced by a broken mirror was made deliberately with a scalpel, and after the wound had been sutured she had pushed the spicules of glass under the skin. When the wound was opened and the spicules removed, she had kept the spicules as "souvenirs" and later reinserted them into the subcutaneous fat. She later milked three of these spicules up into the axilla from the forearm and wrist and received the same gratifying pleasurable sensation.

The episode in which crepitation was found in the forearm and upper arm was produced by injecting air under the skin with a luer syringe; the temperature reading was produced by dipping the thermometer in warm water. When the entire upper extremity was opened widely on the suspicion of gas bacillus infection, she was rather gratified and claimed that even the dressings (which would ordinarily be painful to someone else) were a pleasant experience to her. She explained the episode of "tetanus" by stating that she actually thought she was developing tetanus, and in order to make sure she would be treated thoroughly, produced all the signs and symptoms of tetanus.

During the last hospital admission the patient claimed that she rubbed sandpaper over her skin and injected air underneath the skin in order to simulate a gas bacillus infection. At the same time she swallowed a boxful of sulfonamide tablets in an attempt to commit suicide, thinking she would be "signed out" as having a gas bacillus infection which would not carry stigma or disgrace to her family. Because this suicide attempt was not successful, she drank a bottle of rubbing alcohol when the nurse's back was turned and produced the violent gastroenteritis bout.

CASE 2

Case 2. A 33-year-old, white, single female, a medical secretary and technician, was admitted to the University of California Hospital on November 15, 1945. Six months prior to entry she had had the left long saphenous vein ligated. Shortly thereafter infection and ulceration appeared in the groin at the site of operation. The ulcer spread rapidly in spite of the usual treatment and soon involved the entire anterior abdominal wall. In the course of 11 months, the patient had multiple surgical procedures (excision of undermined areas and skin grafts) and had received local and parenteral penicillin, streptomycin, activated zinc peroxide, Dakin's solution, furacin, and other medication. Undermining tunnels would develop with regularity under the skin edges. At no time did bacteriological studies reveal the symbiotic organisms diagnostic of phagedenic ulcer or the microaerophilic streptococci seen in chronic undermining ulcer as described by Meleney.[2, 3]

Because of increasing irritability, unmanageable behavior and threat of suicide, the patient was transferred to the psychiatric ward of the San Francisco Hospital. Investigation revealed a forceful, aggressive, and opinionated woman who had been "on her own" since the age of 15. Her father, a kind and affectionate person, was accidentally killed when she was five years of age. Her mother, burdened with five children, had had little time for "affection but saw to it that we ate." As long as she could remember, she had been "attached" to her only brother, five years her senior, and it was quite clear that he acted the role of the father. All her life she had resented her younger sister because of the latter's attractiveness, social success and marriage. The sister was the favorite in the family, and by contrast our patient "had to fight for acceptance and approval." The patient was particularly conscious of her obesity. Her weight between the ages of 15 and 30 years ranged between 250 and 325 pounds.

The patient left her home at the age of 15 and worked as a domestic in the household of physicians. With encouragement, she took courses in medical secretarial work and, in addition, studied to be a surgical technician. She had always been "interested in anatomy" since an appendectomy at 16 years of age, and her interest was enhanced further by four separate operations for the removal of glass particles from the palm of her right hand. These episodes were incurred "accidentally" during chemistry experiments. She had had virus pneumonia in November, 1943, and during convalescence had developed hysterical aphonia which cleared in three weeks' time. In the following spring she had lobar pneumonia and again was aphonic. She had aphonia for the third time in June, 1945, when she was hospitalized.

In her personality makeup she tended to be shy and sensitive. Meeting people was "painful" and she felt that her relationships with people were handicapped by her obesity. She always tried to do more than was expected of her so that she would be placed in a position of responsibility. She had been dependent upon others only to the extent of requiring recognition for her work, and was otherwise independent. The patient revolted against being powerless due to hospitalization, and was most annoyed at not being given a voice in the administration of her treatment.

The impression of the psychiatric staff was that the patient had a hysterical character with strong masochistic drives. As she was not psychotic, she was referred to the surgical ward of the San Francisco Hospital.

Although she was under continuous observation, the hemorrhages from the ulcerations were so severe that repeated transfusions of whole blood were necessary to correct the anemia which developed. Because there was no improvement, on July 17, 1947, the patient was placed in a single hip spica cast extending from the shoulders to the lower leg. When the cast was removed on August 19, 1947, all areas of former ulceration were filled with granulation tissue or covered by epithelium, except for a small area 2 inches away from the cast in the right lower quadrant which could have been traumatized by the patient's movements. A second body cast was applied which gave even greater restraint. The patient reacted to this with violent verbal abuse, threats of suicide, and outbursts against the physician and nursing staff. The threats of suicide were frequent and were followed by periods of great remorse and contrition. On many occasions the patient was observed in an attempt to reach and irritate the ulcer with tongue blades or any other instrument available. The patient was discharged from the hospital fully recovered from the self-inflicted ulcerations. Psychiatrically, she continued to the end to defy everyone in the most obscene terms and at no time did she acknowledge her role in the affair.

DISCUSSION

When self-mutilation is considered in the broader sense, as proposed by Menninger, to include multiple operations and purposive accidents, then some consideration must be exercised by the surgeon in choosing his operative material. Apparently the only significant index is a history of emotional disturbances, but the frequency of these makes the problem even more complex. Again, the surgeon himself hardly has a choice in the matter when he is confronted by a problem which, in his best judgment, requires surgical intervention. The surgeon is accustomed by his training to give relief from suffering, and it is entirely foreign to him even to imagine that the patient might mislead him for the sake of the pain needed psychologically. This deception on the part of the patient accounts for the hostility and resentment that the surgeon then turns upon the patient.

The patients in whom self-mutilation occur are notoriously cunning and secretive, and in the two cases cited the factual psychological material was elicited many months after the initial surgical procedure. The dermatologist, on the other hand, is keen to recognize in the original examination evidence of self-mutilation and his immediate treatment is based on those findings. The surgeon and the psychiatrist should strive to attain that degree of diagnostic acumen.

From the material presented one may assume that in addition to the fulfillment of aggressive drives, and the need for self-punishment, a measure of erotic satisfaction was likewise obtained. This fact was verbalized in the first case, and in the second case the physical movements and gyrations followed by relaxation were clearly suggestive. This interpretation was given but was vigorously denied by the patient.

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* * *

A Simplified Method of Making Color Photographs of Oral Lesions

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IN THE past teaching in the field of pharyngeal disease has been hampered by lack of good photographs in color. The occasional good color photograph obtained from the medical photographer was of little value because the average collection is not sufficiently extensive for comparison.

The otolaryngologist who wishes to record an interesting lesion will all too frequently let the material slip away because of the difficulty involved in meeting with the photographer and the patient, plus the indifferent results obtained and the expense involved.

Photography of the mouth, and particularly the posterior pharynx, presents certain peculiar difficulties. The depth of the oral cavity is such that a great depth of focus is needed in the finished picture for proper orientation. This in turn requires a source of light of high intensity as well as correct color temperature.

The frequent movements of the tongue and pharynx necessitate a very short exposure time. This makes ground glass focusing and manual light adjustment most difficult because of the movement which occurs between focusing and photographing. The necessary use of a tripod in these circumstances is cumbersome and time-consuming.

Most clinical photographers favor cameras with a 4-inch to 6-inch lens because of the adaptability to other types of work.

In oral photography a short focal length lens (2-inch) is of considerable advantage since, other factors being equal, a short focus lens will have a greater depth of field and wider angle of view. This reduces the masking effect of the mouth (Figure 1).

An ideal technique for pharyngeal photography should embody the following factors: (1) High intensity, color-corrected light source originating as close to the camera lens as possible—that is, paraxial light; (2) maximum depth of focus; (3) short exposure time; (4) elimination of tedious finding and focusing: (5) elimination of manual light estimation and adjustment: (6) constant predictable results; (7) speed of operation; (8) portability.

Cameras which embody many or all of these features have been previously described,[1] and even marketed commercially. However, these are either individually constructed and correspondingly expensive or they require manual finding and focusing for each exposure.

A camera suitable for the purpose and considerably less expensive was made of a popular "candid" camera plus standard accessories with the addition of a lamp housing which was constructed from a metal can and bayonet base socket using pocket tools. At pre-war prices the completed unit involved an expenditure of approximately sixty dollars.

The camera employed is an Argus C-3, 35 mm. with a built-in flash synchronizer and a 2-inch lens. To this was added a ½-inch lens extension tube and mounting ring with two 7½-inch legs (Figure 2). These are part of the standard Argus Macro-kit. With this equipment the camera is in sharp focus two inches beyond the tips of the legs. The mounting ring is so designed that the tips of the legs represent the size and position of the right border of the camera field. Light source consisting of a No. 5 photoflash bulb was mounted in a metal can and attached to the camera on the left side of the lens. The amount of light from the flash bulb is limited by a 9/16-inch circular aperture in the front face of the lamp housing. The flash duration for a No. 5 bulb at one-half peak is approximately 1/75th of a second. This produces an exposure rapid enough to "stop" pharyngeal movements. The shutter synchronizer is set at 1/20th of a second so that the flash bulb determines the length of exposure. The iris diaphragm of the camera is set at the maximum of f:18. The film employed is either type A Kodachrome or Ansco tungsten.

In order to reduce the color temperature of the flash bulb from 3800 K to a value more suitable for this type of film, a chrome flash filter is attached ahead of the camera lens. This results in greatly improved color rendition for this type of work. The

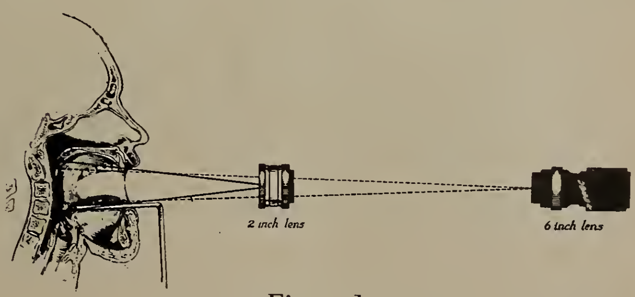

Figure 1

From the Department of Otolaryngology, Division of Surgery, University of California Medical School, San Francisco, California.

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use of a photoflash light source obviates troublesome line voltage variations or cumbersome voltage regulators.

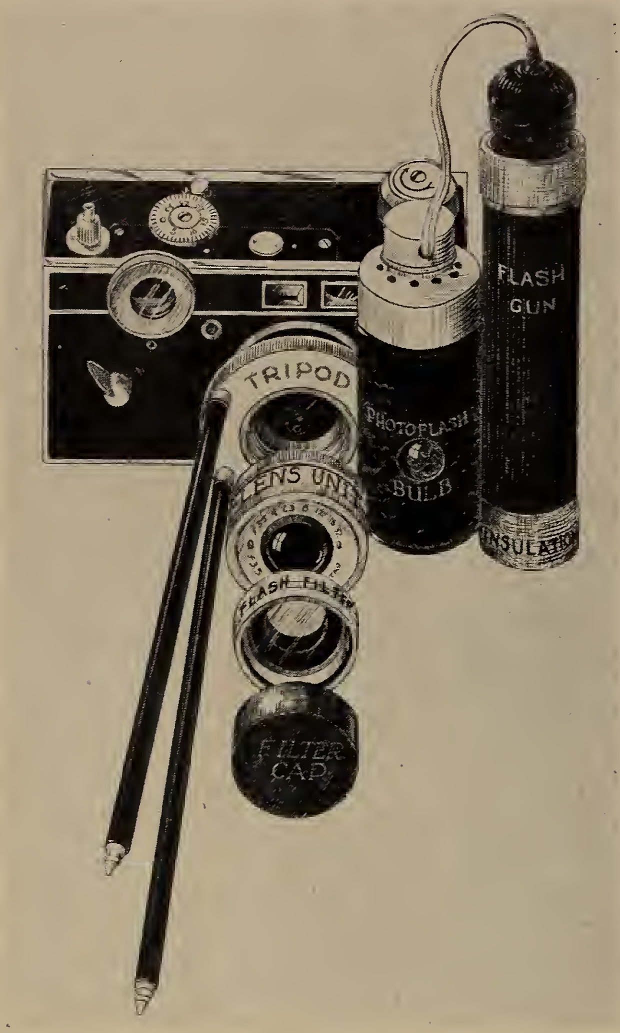


Figure 2

Exposure of the pharynx is facilitated by use of metal cheek retractors held by an assistant and a metal tongue blade held by the patient but placed by the photographer. The camera is then aligned by quickly placing the two legs against the patient's left cheek, raising it so that it is perpendicular to the mouth and releasing the shutter (Figure 3). With this technique exposure, distance, and field are all adjusted synchronously and accurately. With practice, three to five exposures can easily be made without removing the retractors or tongue blade from the patient's mouth.

The 35 mm. film was selected because of its inexpensiveness and for the additional advantage that four exposures may be mounted on the standard 3¼ x 4-inch lantern slide. This makes possible the simultaneous presentation of various combinations

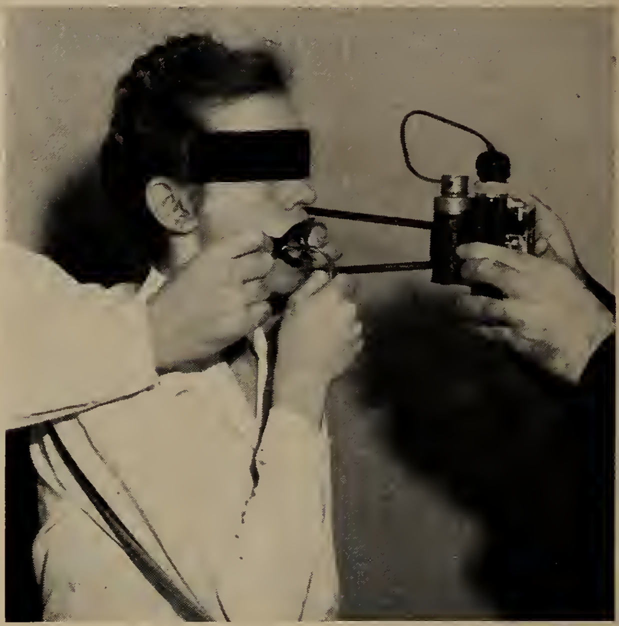
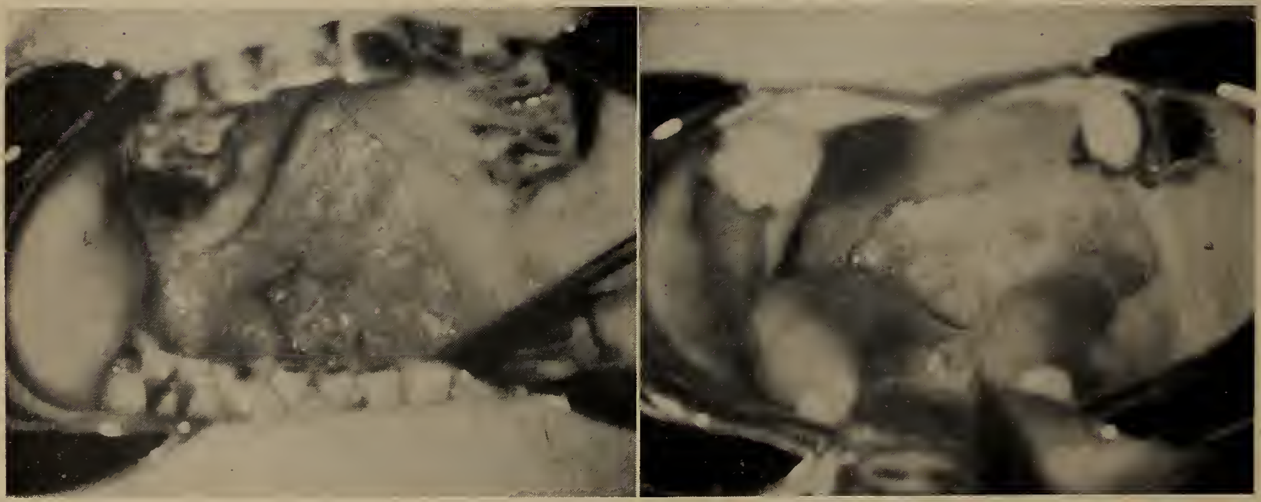


Figure 3



(Left) Black and white reproduction from the original 35 mm. Kodachrome transparency showing an extensive squamous carcinoma of the posterior pharynx. (Right) Black and white reproduction from the original 35 mm. Kodachrome transparency showing the characteristic stellate scarring following luetic pharyngitis.

—for example, the clinical and microscopic appearance of tumors, the appearance before and after treatment, or comparison of gross and microscopic phases of various lesions.

490 Post Street.

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Discussion by J. Walter Wilson, M.D., *Los Angeles*

Photographs are such excellent clinical records that any process or mechanical contrivance which makes it easier to obtain them should receive the most enthusiastic and widespread support. The clinician whose practice is limited to one area of the body is fortunate because it is within the realm of possibility to develop a mechanical camera in which the focal distance, area included, exposure time and light intensity are all fixed. In the present instance, however, this advantage is somewhat outweighed by the facts that the oral cavity is a difficult area to light and that such a depth of focus is required to keep the lips as well as the postpharyngeal wall sharply within focus.

Some years ago I had the opportunity of being an understudy of Dr. Donald Miller, a dentist of San Leandro, California, who has done what I believe to be the most beautiful motion picture photography in color of the mouth. The problem of lighting is a very real one in work of that type, since it must be maintained for several minutes continuously. This has been overcome by Dr. Sooy in the present instance by the use of the flash bulb, adaptable, of course, to still pictures only. We were never able to obtain satisfactory results with a single light source; some part of the oral cavity seemed always to be shadowed. Two lights, neither in the same vertical or horizontal plane, were much more suitable. The use of two flash bulbs incorporated into Dr. Sooy's camera might be worth trying.

We also found that shiny, chrome plated retractors gave too much extraneous light by reflection and resulted in objectionable high-lights. This was obviated by using retractors made of methyl methacrylate (Lucite). Their transparency also resulted in a much more beautiful picture, in our opinion, seeming to possess less artificiality.

Finally, I should like to point out that under certain limitations light may be guided around corners and for considerable distance by methyl methacrylate without loss in intensity as long as the critical angle is not exceeded, emerging only where the usual polished mirror-like surface is destroyed by roughening or sandblasting. The use of retractors properly constructed of this substance might allow light sources that otherwise would be uncomfortably hot for the patient, to be used at a distance. Intense light then could be guided into the oral cavity from all sides, without accompanying heat.

* * *

Roentgen Therapy of Rheumatoid Spondylitis

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SUMMARY

Based on the pathological processes involved in rheumatoid spondylitis, comparison is made between the physical qualities of certain techniques of roentgen therapy. Graphic representation of the isodose curves and the homogeneous distribution of radiation pertaining to the method herein advocated is shown.

Results obtained in the treatment of 125 cases illustrative of the evolution of technique experienced at the University of California Hospital are tabulated. The indications, contraindications, and complications of the method are discussed.

Practically every patient with rheumatoid spondylitis, regardless of the stage of the disease, was benefited, with the best results having been obtained when the radiation was given in three courses, separated by rest periods, and homogeneously distributed along the spine.

FIFTY years have passed since x-rays were first used in the treatment of spondylarthritis, for the reports by Stenbeck and by Sokolow appeared in the foreign literature in 1898, only three years after Roentgen's discovery of the rays. Anders, Daland and Pfahler[1] (1906) are credited with the first report in this country.

Since then, and especially following the stimulus generated by Smyth, Freyberg and Lampe[9] in 1941, the use of roentgen irradiation in combatting rheumatoid spondylitis has become widespread. Numerous variations in physical factors and treatment techniques have been used, all apparently with fairly good results.

This discussion is concerned with the technique evolved and the experience gained in the treatment of patients referred to the therapy section of the department of radiology at the University of California Hospital between 1942 and 1948. Most of the patients came from the arthritis clinic, where the diagnosis was established after complete preliminary study by the arthritis committee. Some patients referred by private physicians are also included in the analysis.

It is not the purpose of this report to enter the argument concerning etiology, or whether rheumatoid spondylitis and rheumatoid arthritis are manifestations of the same or different disease entities. Similarly the well established clinical and roentgen criteria for diagnosis will not be reviewed. However, it should be mentioned that the high incidence of peripheral joint involvement noted in this group appears to be more than mere coincidence, and suggests that stronger consideration should be given to the concept of a systemic disease affecting either the joints of the spinal axis, or the peripheral joints, or both.

Because of the difficulty in obtaining material for microscopic study, the actual changes which occur within the affected joints have not been unequivocally established except in advanced cases of long duration that came to autopsy for other reasons. However, the disease has been classified by the American Rheumatism Association in the category "Probably Infectious (Etiology Not Known)," in which are also included rheumatic fever, rheumatoid arthritis and Still's disease. Steinberg[10] and Angevine[2] are in essential agreement with regard to the pathological findings, and have clarified the situation to some extent. The joints involved contain synovial membrane and articular cartilage. The initial response to the disease has been noted as synovial inflammation and edema, with thickening and infiltration of the subsynovial tissues by lymphocytes, monocytes, and plasma cells. Fibrinoid material, sometimes several layers thick, deposits over the surface of the synovial lining. Apparently, the next phase of the process is the proliferation of fibrous connective tissue in the region of the perichondrium, forming a vascular granulation tissue pannus which spreads over the surface of the articular cartilage, resulting in disturbed nutrition of the cartilage and consequent disintegration of it. Because of its close approximation the pannus tends to fuse with that covering the opposing cartilage, and in the subsequent attempt at repair, fibrous ankylosis and even bony fusion becomes the end result. It is apparent, therefore, that the disease is a chronic mesenchymal inflammatory disorder of the reticuloendothelial system.

In the attempt to control the crippling effects of the disease, a variety of techniques of x-ray therapy using beams of diverse physical qualities has been

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The cooperation and assistance given by the physicians who permitted access to their private records is gratefully acknowledged.

utilized. Of these, the method known as "wide-field" technique, devised by Scott,[8] has gained considerable prominence and numerous advocates both here and abroad.

Using x-rays generated by 130-140 kv, with 3 mm. aluminum added filtration, or 100 kv with 1 mm. aluminum added filtration, Scott initially covered the whole trunk in two overlapping fields approximately 30 centimeters in diameter. Later, with the use of a specially designed wide angle tube, covering a diameter of approximately 54 centimeters at a tube-skin distance of 40 cm., he irradiated the entire torso in a single field, delivering 60-100 r (air) at the center of the field.

He stated that uniform distribution of radiation over the field was not essential, but instead attempted to endow the patient with a generalized or "constitutional stimulating effect" or "state," which he called "saturation."

It is not within the province of this presentation to discuss whether or not roentgen irradiation, of either long or short wave length, has a stimulating effect. However, confirmation of the lack of uniformity of absorption in the field of treatment is easily established, by reference to isodose charts. The authors have been unable to find such graphs for the "wide-angle" tube, but curves applicable to the beam used by the advocates of the so-called "modified Scott wide-field technique" are available (Figure 1).

The joints of the spine with which we are concerned lie at an approximate depth of 6 to 7 centimeters from the overlying skin surface. The differential of absorption between the center and the periphery of the field, at this level, is readily appreciated. An even greater gradient would be expected with the single large field.

In contradistinction to the method just described, McWhirter[6] treats locally to the area of the sacro-iliac joints and the lumbar spine, using long narrow fields, and utilizes the considerably harder radiation generated with 250 kv and 1 mm. steel (inherent) filtration, giving daily treatment to a total of 2,500 r (skin). On occasion, he treats the entire length of the spine with similar dosage. Pohle and Morton[7] also use beams of shorter wave length, generated by 200 kv, or 400 kv, with half-value layers of 1.05 mm. copper and 2.4 mm. copper, respectively, and treat three elongated areas to a total of 450-600 r (air) in three to six days. Similar factors are advocated by Hemphill[5] and Reeves, and by Baker.[3]

Except for Freyberg and his associates, the courses of treatment were repeated only upon recurrence of symptoms. Freyberg now advocates repetition of the course of treatment three times, at four to six week intervals, but in his last report[4] states that fewer complications develop if rays of longer wave length, generated by 140 kv, are used.

TECHNIQUE

The method of treatment at the University of California Hospital has undergone a process of gradual evolution since its inception during the latter part of 1941. At first, treatment was directed locally to painful areas only, usually the region of the lumbar spine and sacro-iliac joints. Later, using moderately elongated fields, the thoracic spine was included. Courses of treatment were repeated only upon recurrence of symptoms.

The use of relatively small fields extending along the entire spinal axis has been practiced since 1944. In people of average length, four portals are placed longitudinally along the vertebral column, with a single field placed horizontally to cover the sacro-

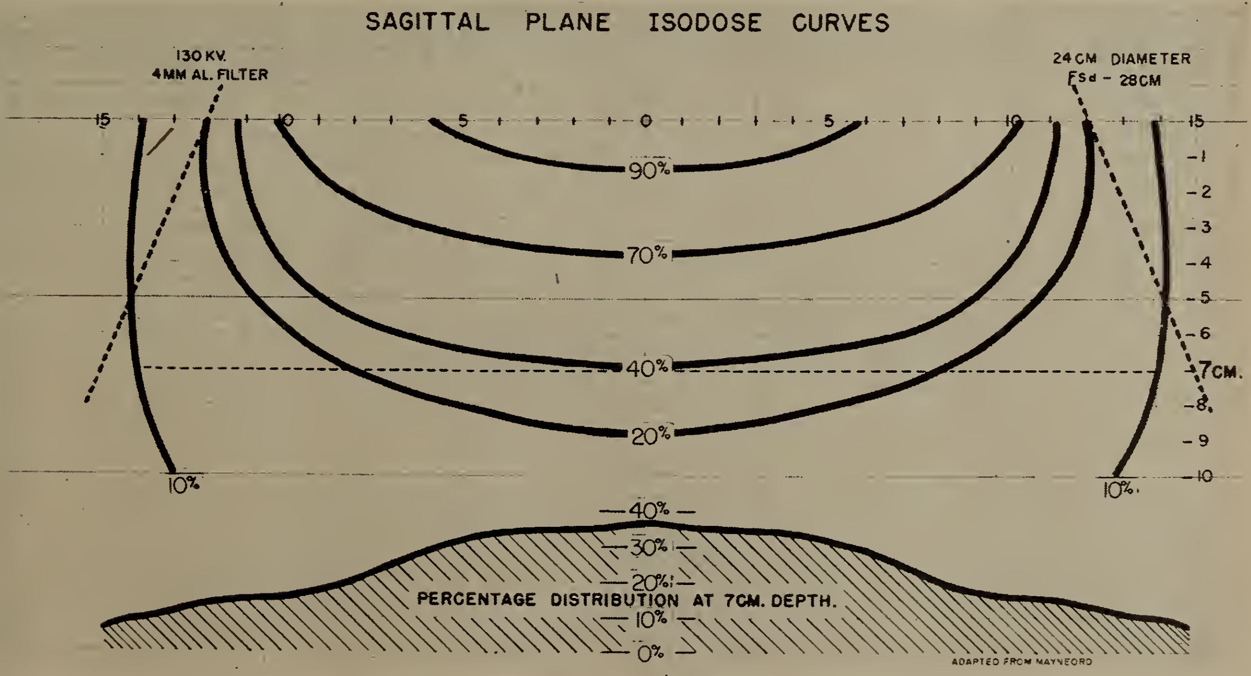


Figure 1

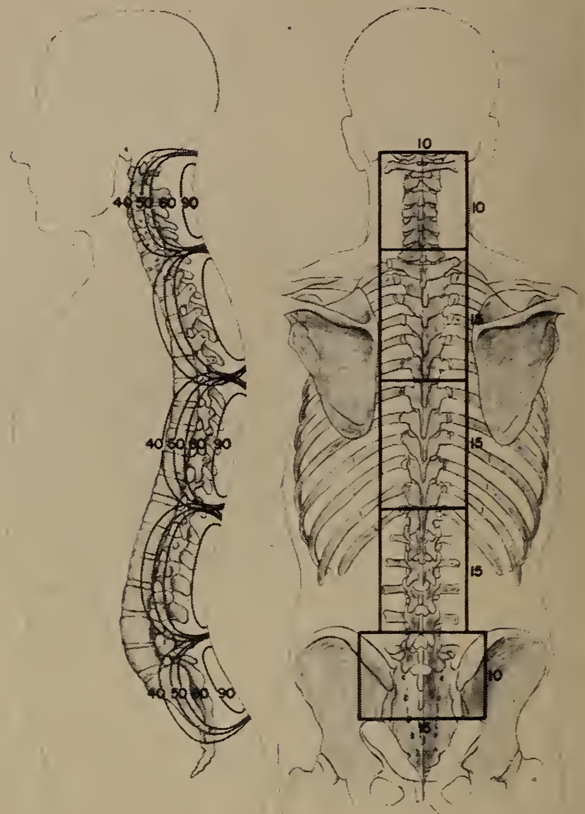
iliac joints. The most superior field measures 10 x 10 cm., and the others are 10 x 15 cm. In shorter people, the spine is easily covered by three 10 x 15 cm. portals placed longitudinally, the sacro-iliac port being transversely situated as before. The fields are delineated by an indelible skin-marking ink, so that the treatment cone may be identically placed each time. This inked boundary of adjacent portals results in separation of the fields by 5 to 7 millimeters.

Using x-rays generated by 200 kv constant potential, HVL 1.05 mm. copper, 50 cm. target-skin distance, and an output of approximately 45 r per minute, 200 r (air) are delivered to the upper and lower halves of the vertebral column and paraspinal musculature on alternate days, for a total of 600 r (air) per field. Isodose curves illustrative of these factors are indicated in Figure 2.

For treatment of a chronic inflammatory lesion on the surface, it is desired to deliver 75 to 150 r to the process at each treatment. For surface lesions, beams of "softer" quality are adequate, but in order to deliver the same dose at the depth with which we are concerned, it is felt that a beam of the quality described is more appropriate. The 200 r (air) is equal to 263 skin roentgens on the 100 square centimeter field, and 273 skin roentgens on the 150 square centimeter fields. At the average depth of 7 centimeters, the calculated tissue dose therefore is 121 r and 134 r respectively.

Graphic illustration of the resultant distribution of the radiation, as shown by sagittal plane isodose curves superimposed along the spine, corresponding to the portals of the incident beam, are shown in Figure 3.

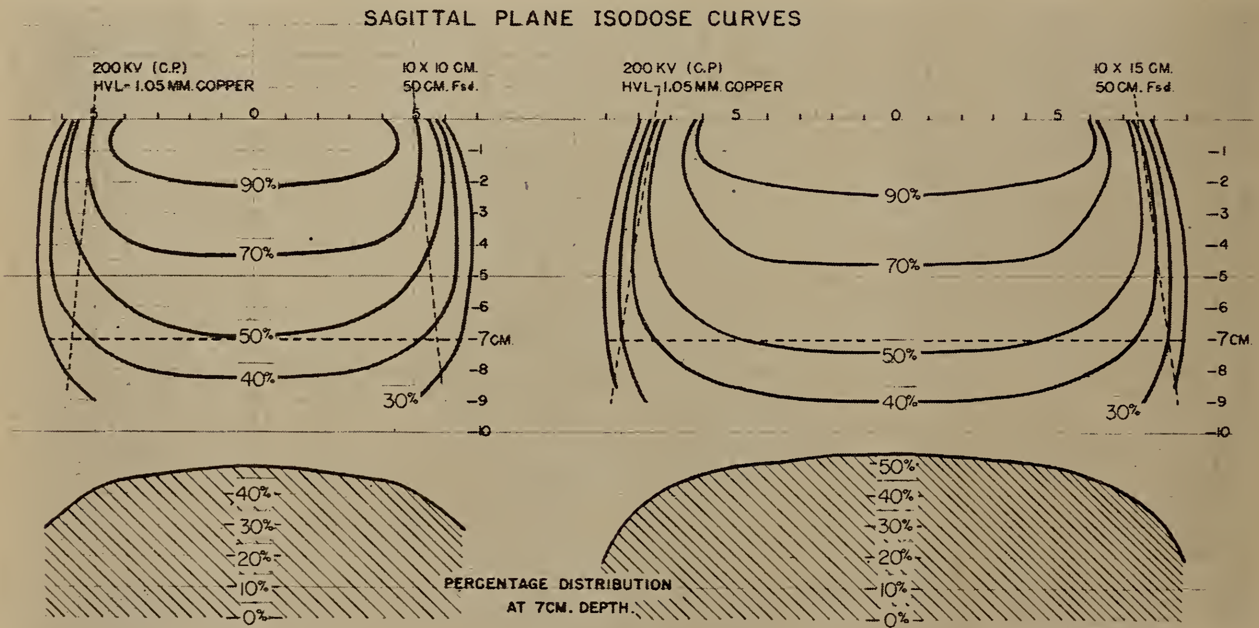
That this accomplishes homogeneous irradiation in the region of the apophyseal and sacro-iliac joints of the spine is indicated in Figure 4, which represents the percentage depth dose in the sagittal plane, at a depth of 7 centimeters from the skin surface. The small peaks or "hot spots" caused by the over-



SAGITTAL PLANE ISODOSE CURVES AND PORTALS

200KV CONSTANT POTENTIAL HVL-1.05mm COPPER

Figure 3



ADAPTED FROM WEATHERWAX-ROBB

Figure 2

lapping divergence amount to only approximately 10 per cent. This becomes necessary if radiation sufficient to control the chronic inflammatory state is to be delivered.

After a rest period of four weeks, a second identical course of treatment is given, and after a second rest period of 12 weeks, the third and final course of treatment is administered.

Since the latter part of 1941, a total of 167 patients with rheumatoid spondylitis have been treated. Of these, 42 were excluded from the reported series because of incomplete data.

The 125 cases analyzed have been subdivided into four groups: (1) those receiving three courses; (2) those receiving two courses; (3) those receiving a single course, and (4) those receiving local treatment. Since division into stages of disease, as indicated by roentgen findings, is at best an arbitrary classification not particularly dependent upon the duration or severity of symptoms, such segregation has not been attempted.

Instead, the response of the group, without regard to such staging, has been taken as a test of the efficiency of the method in control of symptoms and prevention of recurrence, since pain may be alleviated and muscle spasm relieved, even in the most advanced stages.

The cases are broken down according to sex and age of the patients at the time treatment was started, as indicated in Table 1.

Subsequent to the completion of each course of treatment, the patients were followed by the referring physicians, with such orthopedic and general supportive measures and physical therapy as was deemed necessary. Prior to each course of roentgen therapy, and oftener if indicated, a complete blood cell count and sedimentation rate determination was obtained.

Response was measured subjectively and objectively and recorded as the consensus of the arthritis committee or by the private physician. Subjective criteria included presence or absence of pain, ability to assume a single position for any considerable period of time, and ability to sleep.

TABLE I

	THREE COURSES		TWO COURSES		ONE COURSE		LOCAL	
AGE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
15 - 19	1	1	0	1	0	0	1	0
20 - 24	5	1	4	2	0	2	0	0
25 - 29	12	2	5	1	2	0	4	0
30 - 34	9	2	3	4	1	1	1	0
35 - 39	15	2	5	0	1	0	0	0
40 - 44	13	0	4	2	1	1	0	0
45 - 49	1	3	0	0	0	1	0	0
50 - 54	4	1	2	1	0	0	0	0
55 - 59	0	0	0	1	1	0	0	0
60 +	1	0	0	0	0	0	0	0
TOTAL	61	12	23	12	6	5	6	0
NET TOTAL	73		35		11		6	

Objective criteria included blood cell counts and sedimentation rates, degree of mobility of the spine, increase in chest expansion, correction of postural defects, change in weight, and, in a few instances, comparative roentgenograms of the spine.

EVALUATION OF RESULTS

Table 2 indicates the period over which the patients were followed for determination of response:

In order to properly evaluate a therapeutic modality, any associated undesirable reactions or effects must be weighed against the benefits. The more significant of these complications are gastro-intestinal disturbances, usually transient in nature, which occur concomitantly with the series of roentgen treatments. Of more grave significance is the development of leukopenia, which usually appears subsequent to a treatment course. A count of less than 4.000 leukocytes has been considered indicative of leukopenia. In addition, menstrual dysfunction or amenorrhea may occur in females of child-bearing age. But except for the latter effect, which may be permanent, the most important consideration is the incidence of recurrence of symptoms in the back.

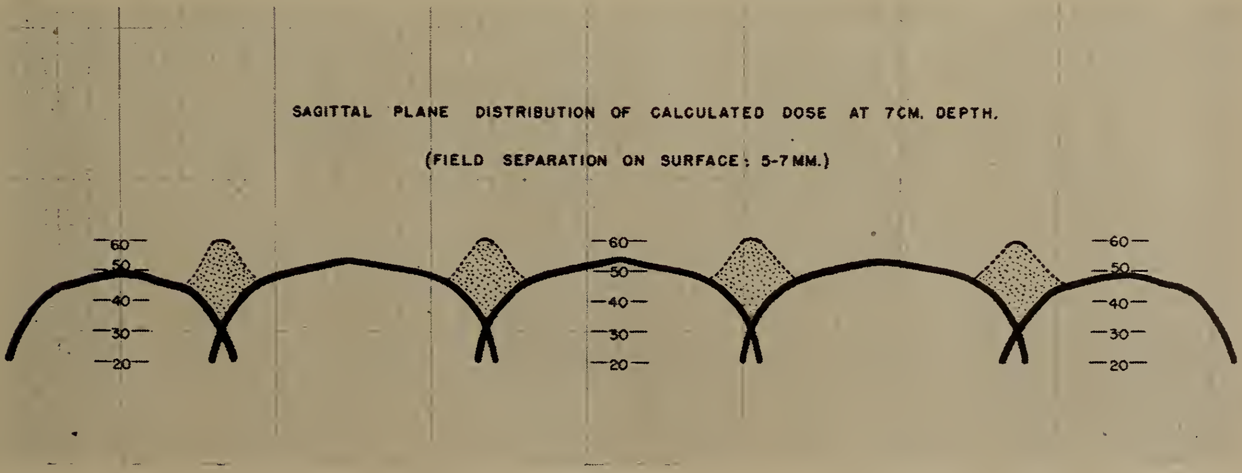

SAGITTAL PLANE DISTRIBUTION OF CALCULATED DOSE AT 7CM. DEPTH.
(FIELD SEPARATION ON SURFACE: 5-7 MM.)
60
50
40
30
20
60
50
40
30
20
60
50
40
30
20

Figure 4

Symptoms were not relieved, or they recurred, in 10 of 73 patients (13.8 per cent) treated with three courses; in 13 of 35 patients (37.1 per cent) receiving two courses, and in 6 of 11 patients (54.5 per cent) receiving only a single course. All the patients treated locally suffered recurrence, and subsequently were given treatment to the whole spine, three having received three courses, two having received two courses, and one a single course.

These findings, the other complicating reactions, and the incidence of associated peripheral joint involvement are summarized in Table 3:

Several pertinent facts become apparent as these results are studied. Any active case of rheumatoid spondylitis warrants roentgen therapy, regardless of the duration and severity of symptoms, or stage of disease as indicated by roentgenograms. For a patient with even the most advanced case will probably be relieved of pain and muscle spasm, while increased motion of the spine and thoracic cage will be regained by those in whom fixation and ankylosis has not occurred, especially if orthopedic and general supportive measures are prescribed in association.

TABLE II

CASES ACCORDING TO FOLLOW-UP INTERVAL

	THREE COURSES	TWO COURSES	ONE COURSE	LOCAL
1-5 MOS	26	14	3	2
6-12 MOS	17	5	1	0
1-2 YRS	15	5	1	2
2-3 YRS	10	8	2	0
3-4 YRS	4	2	1	0
4-5 YRS	1	1	2	0
OVER 5 YRS	0	0	1	2
TOTAL	73	35	11	6

TABLE III

COMPARISON OF RESULTS

		G-I DISTURBANCES		LEUCOPENIA		AMENORRHEA	RECURRENT BACK SYMPTOMS	PERIPHERAL INVOLVEMENT	
	AGE	MALE	FEMALE	MALE	FEMALE			MALE	FEMALE
THREE COURSES (73 CASES)	15-19	1	0	0	1	0	1 AT 18 MONTHS	1	1
	20-24	3	1	1	1	0	——	5	1
	25-29	3	0	1	1	2	1 AT 12 MONTNS	7	0
	30-34	0	0	0	1	1	1 AT 4 MONTNS	1	0
	35-39	6	0	2	0	1	1 AT 12 MONTNS 1 AT 15-19-23 MOS 2-NO RESPONSE	4	1
	40-44	4	0	0	0	0	1 AT 18 MONTHS 1 AT 3 YRS (CERVICAL)	7	0
	45-49	1	3	0	0	0	——	0	1
	50-54	0	0	0	1	0	1 AT 2 MONTHS	1	1
	55-59	0	0	0	0	0	——	0	0
	60+	0	0	0	0	0	——	1	0
	TOTAL	18	4	4	5	4	10	27	5
	NET TOTAL	22		9		4	10 (13.8%)	32	
TWO COURSES (35 CASES)	15-19	0	0	0	0	0	1 AT 6 MONTNS	0	1
	20-24	3	0	0	1	0	1 AT 3-13 MONTHS	2	2
	25-29	2	1	0	1	1	1 AT 1 MONTN 1 AT 18 MONTHS 1 AT 4-24 MONTHS	2	0
	30-34	1	2	0	1	2	1 AT 3 MONTNS 1 AT 4-8 MONTNS 1 AT 14-26 MONTNS	2	3
	35-39	1	1	0	0	0	1 AT 7 MONTNS	3	0
	40-44	3	1	1	1	0	1 AT 5 MONTNS 1 AT 4 MONTHS	3	2
	45-49	0	0	0	0	0	——	0	0
	50-54	0	1	0	0	0	1 AT 6 MONTNS	1	1
	55-59	0	0	0	0	0	1 AT 2-4 MONTHS	0	1
	TOTAL	10	6	1	4	3	13	13	10
	NET TOTAL	16		5		3	13 (37.1%)	23	
ONE COURSE (11 CASES)	20-24	0	1	0	0	0	1 AT 3-6-18 MOS	0	1
	25-29	1	0	0	0	0	1 AT 17 MONTNS	1	0
	30-34	0	0	0	1	0	1 AT 24-48 MOS	1	1
	35-39	0	0	0	0	0	——	0	0
	40-44	0	0	0	0	0	1 AT 5 MONTHS	1	0
	45-49	0	0	0	0	0	1 AT 2 MONTNS 1 AT 36 MONTHS	0	0
	TOTAL	1	1	0	1	0	6	3	2
	NET TOTAL	2		1		0	6 (54.5%)	5	

No actual contraindications to roentgen irradiation exist, except that treatment should be withheld if leukopenia is noted. Local heat, diathermy, and infra-red lamps should be avoided during and approximately two weeks before and after a course of x-ray, in order to avoid an undesired skin reaction.

The complications to be expected have been mentioned. Of these, only artificial menopause appears to be permanent, but fortunately the incidence appears quite low. Leukopenia may occur, apparently more likely in women, without regard to age, but is transient in nature. Similarly the gastro-intestinal disturbances clear soon after a course of treatment, and may be moderated if not completely controlled by the use of parenteral vitamin B components, trasentine and phenobarbital, or such anti-histaminic agents as pyribenzamine or benadryl.

Although in many cases there was a drop in sedimentation rate, the real value of the test as a good criterion of therapeutic response appears doubtful. At least it did in this series. Since 48.8 per cent of those treated had involvement of the peripheral joints as well as the spine, indicating the systemic nature of the process, a permanent drop in the sedimentation rate could hardly be expected unless the spine were the only site of disease activity. However, it is not disputed that the sedimentation rate remains of value in initially establishing the diagnosis.

DISCUSSION

The results obtained after treatment locally, compared to one, two, or three courses to the entire spine, indicate that the three-course technique with properly spaced rest periods is the most efficient in permanent relief of symptoms. The dose delivered by the latter method is in accord with the principles of therapy for chronic inflammatory processes, and explains the relief of pain and muscle spasm. Although microscopic proof is lacking, the radiobiological effect probably is primary in the action on the lymphocytes, monocytes and plasma cells infiltrating the synovial and subsynovial tissues.

The destruction of the leukocytic infiltration as the result of the first course of treatment probably accounts for the initial relief noted by most patients. Recovery of injured cells leads to resurgence of the low grade inflammation, which again is dampened by the second course of treatment. The residual inflammatory components, more likely to have been injured by the two previous exposures to radiation, are less likely to recover, and are more likely held in permanent abeyance by the third series. If these circumstances exist, the need for homogeneous distribution of the radiation becomes more apparent.

Whether or not the metabolic activity of the fibroblasts is also affected is more difficult to hypothecate. While one might expect a response to radiation such as is shown by many keloids, nevertheless, in several instances, check roentgenograms have shown advancement of the ligamentous calcification and fusion of the articular processes in a symptom-free patient. Furthermore, no alteration has been detected in those cases which have progressed to ankylosis and extensive calcification of the paraspinal ligaments.

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CASE REPORTS

- Massive Hematemesis Due to Acute Erosion of the Gastric Mucosa
- Fracture of the Ribs by Muscular Action Other than Coughing or Sneezing
- Thromboangiitis Obliterans in a Woman: Factor of a Mild Electric Shock in Initiating Gangrene
- The Use of BAL in Generalized Argyria

Massive Hematemesis Due to Acute Erosion of the Gastric Mucosa

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HEMORRHAGE from the gastro-intestinal tract, whether indicated by hematemesis or melena, has always been of interest to the clinician and often challenges his diagnostic ability. The known causes of such hemorrhage have been adequately classified,[3] but there is occurrence of bleeding from the alimentary tract which has thus far been unexplained.[9] Experience gained in treating such a patient recently has taught us that massive hemorrhage can result from acute transitory erosion of the gastric mucosa. This lesion has been described in the literature,[2] but it is our belief that it is not recognized by clinicians as frequently as it might be. Patients who have hematemesis are usually treated by conservative measures, and frequently x-ray studies of such patients, made after their symptoms have subsided, show no abnormality of the stomach. Since death can result from massive hematemesis, however, surgical intervention in certain instances may be life-saving. The following case report is illustrative:

The patient, a white female 40 years of age, was hospitalized after vomiting large amounts of blood during the preceding 48 hours. She complained also of weakness and sweating. Questioning revealed that the patient had been in excellent health, without symptoms, before the onset of this illness. On one occasion, nine years before, she had been hospitalized for three weeks because of hematemesis. At that time conservative medical therapy was followed by complete recovery. Repeated x-ray examinations made then showed no abnormality of the gastro-intestinal tract.

Examination showed the patient to be thin, acutely ill, obviously in shock. The pulse rate was 80 and the blood pressure 80 mm. of mercury systolic and 50 mm. diastolic. There was slight tenderness in the epigastrium but there were no other abnormal physical signs.

Shortly after admission, the patient had a large tarry stool. Despite conservative therapeutic measures which included morphine, parenteral administration of vitamin K, withholding of food and fluid by mouth, and elevation of the foot of the bed, the patient's blood pressure fell to 65 mm. systolic and 30 mm. diastolic. At this point, a transfusion of 500 cc. of citrated blood was given intravenously, followed by 1,000 cc. of 5 per cent dextrose. The patient responded well to this therapy and during the ensuing 24 hours the blood pressure varied between 100 and 120 mm. systolic with the diastolic pressure at 70 mm.

On the second hospital day the patient was given a Sippy diet supplemented by intravenous fluids. Her condition continued to improve until the fifth hospital day when again a large amount of blood was vomited and shortly thereafter a large tarry stool was passed. The signs of shock reappeared, the pulse rate rising to 100 and the systolic pressure declining to 80 mm. Emergency laparotomy was decided upon and, in preparation for this, the patient was given a transfusion of 1,500 cc. of citrated blood.

An upper midline incision was made. On preliminary careful inspection, the stomach, duodenum, small intestine, and large intestine appeared normal, except for evidence of gross blood in the lumen of the entire intestinal tract. Since it seemed imperative to discover the source of bleeding, an opening in the stomach was made near the pylorus; when the blood was seen to be coming from the fundus, this small opening was closed and a larger incision made in the fundus. A large blood clot was adherent to the mucosa of the greater curvature and extended to within 5 cm. of the esophageal orifice. When the clot was removed active arterial bleeding from the center of a small, 4 mm. mucosal erosion was observed. A small portion of the stomach wall, which included this lesion, was excised. During operation the patient received 1,000 cc. of citrated blood.

Recovery was uneventful. Before discharge from the hospital, laboratory studies showed negative results in a serologic test for syphilis, normal urinary findings, and rapid recovery from the anemia. Results of gastric analysis on two occasions (12th and 18th postoperative days) revealed normal secretions of free hydrochloric acid.

X-ray visualization of the stomach with a barium meal on the 15th postoperative day was considered normal. Pathological examination of the specimen removed from the stomach wall showed acute erosion of the gastric mucosa.

Three months later the patient was readmitted to the hospital for study. She was symptom free, in excellent general condition, and had gained 15 pounds. Twelve-hour gastric drainage was carried out; 200 cc. of gastric juice was obtained, having a total acidity of 10 degrees. The response to the injection of histamine was essentially the same as on previous admission. Routine blood and urine examinations gave data within normal limits.

Careful study of the patient's personality and environment did not disclose any factors which might be considered causative.

The patient has been observed since then at monthly intervals and has remained well.

COMMENT

The relative frequency of acute erosion of the gastric mucosa as a cause of massive hematemesis is not accurately known. Meyer and Steigmann[6] believed that such a lesion was probably responsible for a third to a half of the occurrences of hematemesis. Whether or not this lesion is a progenitor of the common peptic ulcer is a matter of controversy. It seems clear that x-ray studies of the stomachs of patients who have acute erosion are usually not diagnostic,[5, 6, 7] but some observers have recognized the lesion by means of the gastroscope.[4] Hematemesis resulting from acute erosion of the gastric mucosa was first described by Dieulafoy in 1899; in his patients it was a complication of pneumonia and pneumococcal peritonitis. Similar cases have been reported by Sanford and co-workers.[8] That the acute gastric erosion need not necessarily be associated with pneumonia is shown by the case here reported and by others.[1, 2, 4, 7, 10] Although the great majority of patients who have gastric hemorrhage due to acute erosion respond favorably to conservative therapy, fatalities have been reported.[4, 10] It is also of interest that the patients who have this lesion do not seem to have the personality typical of the chronic peptic ulcer patient.[7]

It is our opinion that operative intervention, limited to such procedure as will accomplish arrest of the bleeding, is life-saving in properly selected cases, notably those in which the patients have repeated massive hemorrhage despite conservative therapy. In such instances, it will be necessary to open the stomach in order to demonstrate the acute erosion. Obviously such operative intervention will not prevent the occurrence of subsequent erosion. Proper treatment and/or prevention of this lesion must await some knowledge of its cause.

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Fracture of the Ribs by Muscular Action Other Than Coughing or Sneezing

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FRACTURE of the ribs is usually described as a result of direct violence, such as falls or blows.[7, 9] In such cases the rib is usually fractured at the site of trauma. In fractures caused by bending and compressions such as an anteroposterior squeeze, the ribs are usually fractured at the junction of their posterior and lateral curves.[1, 9] The injury may be bilateral and may occur in one or more ribs. Fracture of the ribs may be due to pathological and certain other general conditions predisposing to fractures, such as old age, insanity and general wasting diseases.[1] Fracture by muscular action is considered a stress and fatigue fracture similar to the march fractures found in service men undergoing unusual physical exercise.[1, 2] Rib fractures have been reported from simple muscular strains and violent sneezing.[3, 5] Coughing may be responsible especially in severe tracheitis, in pertussis, in pneumonia, in tuberculosis, and in whooping cough. The injury sometimes occurs from the muscular effort of lifting heavy loads, from the strains of parturition and even from the exercises of golf.[4] It may also occur while straining at stool or vomiting.

Cases attributed to sudden and undue muscular strain as in lifting heavy objects are very few in number. Kleiner,[4] in 1924, reviewing the literature, found 56 cases of ribs fractured by muscular action, two of which were in the first rib, while in the rest of the series the fracture was in the lower six ribs. In only 13 of these 56 cases was the fracture caused by violent or sudden muscular action other than coughing. Kleiner added the report of a case in which a man fractured the right third rib while unloading large flagstones. Alderson,[1] in 1944, reported 35 cases of stress fractures of the first rib following "unaccustomed and strenuous exertion." In 1947 the authors of this presentation reported a case of fracture of the first rib due to muscular pull.[8] In the following three cases fracture resulted from sudden muscular action.

CASE REPORTS

Case 1.—A meat cutter, 52 years of age, slipped on a wet floor. He did not fall to the floor but, in breaking his fall, twisted his body and felt something snap in the right side of his chest. Roentgenograms taken on the day of the injury showed fracture of the right fifth rib anteriorly near the axillary region. The fracture healed.

Case 2.—A bartender, 58 years of age, while lifting a heavy beer keg felt sudden sharp pain in the right side of the chest. Roentgenograms taken the following day showed fracture of the right eighth rib posterior to the angle. The patient was discharged clinically cured a month later.

Case 3.—A carpenter, 52 years of age, while pulling hard with his left hand in hanging a door, felt something "click" in the left side of the chest. Roentgenograms five days later showed fracture of the anterior extremity of the left sixth rib with fragments in good position. The patient received treatment for one week and then did not return for further treatment.

The length of the first two and the last two ribs protects them, and because of this protection most fractures due to muscular action occur in the middle ribs, the fourth to the eighth. Fractures of this type rarely occur in children due to the elasticity of the ribs. The average age of individuals suffering fracture of the ribs is over 40 years. About 77 per cent of such occur in males because of exposure and occupations.[7] The fracture is usually of the linear type without displacement and healing takes place without complications. Oechsli[6] is of the opinion that the fractures are probably due to the opposing forces of the obliquus externus abdominis and the serratus anterior muscle.

SUMMARY

Fracture of the ribs due to muscular action as in coughing is of frequent occurrence.

Fracture of ribs due to muscular action other than coughing or sneezing is relatively less frequent.

Three cases are reported of fracture of ribs due to sudden muscular action as in lifting or straining.

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Thromboangiitis Obliterans in a Woman: Factor of a Mild Electric Shock in Initiating Gangrene

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Although the reason cannot be satisfactorily explained, thromboangiitis obliterans (Buerger's disease) in women[1] is rare. Other peculiarities of this disease are its rarity in Negroes,[2, 4] its rare association with diabetes mellitus[6] and its relative preponderance in individuals of Jewish ancestry.[1, 3]

Silbert[5] in reviewing his own series of 1,400 cases of thromboangiitis obliterans found only 12 cases clinically diagnosed in women. The Mayo clinic group[1] in a survey of the literature in 1946 found only 20 reported cases in women, with only four of the 20 proven by microscopic section. Eight were typical cases and eight were apparently not thromboangiitis obliterans. Davis and King[4] reported the only proven case in a Negro woman.

In the diagnosis of thromboangiitis obliterans, care must be taken to exclude the instances of peripheral vascular disease due to phlebitis, embolism, polycythemia and ergot poisoning, and of arteriosclerosis or arteritis due to other causes such as syphilis, periarteritis nodosa, disseminated lupus erythematosus and disseminated arteritis. In arriving at a diagnosis of thromboangiitis in a woman, it should be established that she is a smoker of tobacco, and the following features should be present:

1. Evidence of organic occlusion of the large arteries of the extremities.
2. Onset of symptoms relatively early in adult life.
3. Involvement of arteries in both upper and lower extremities.
4. Absence of demonstrable arteriosclerosis, diabetes mellitus and other causes of peripheral vascular disease.

The following report of a case is submitted not only because of its occurrence in a woman but because of the unusual exciting agent which apparently precipitated the gangrenous process.

REPORT OF A CASE

A white married woman, aged 34, of Dutch-English ancestry, ten years previously had first experienced intermittent aching pains in the fingers of the hand upon exposure to cold, associated with color changes of pallor, blueness and redness. These symptoms gradually increased in severity. Early in 1945 she visited a clinic in the East where Raynaud's disease was diagnosed. Eighteen months before the present illness, pains upon exposure to cold appeared in the toes of the feet, and mild intermittent claudication was felt in both legs upon walking two to three blocks at a normal gait. The patient said she had smoked a minimum of one package of cigarettes daily for many years. There was no history of injury to an extremity or of arthritis, diabetes mellitus, lues, or other contributory disease, and the patient said she had never had thrombophlebitis. There was nothing indicative in the family history.

Present illness: The patient, a telephone switchboard operator, while pulling cords from the switchboard felt pain in the distal portions of the second and third fingers of the left hand, as if strands of wire had pierced the skin. After a few days she reported for medical care. The examining physician's findings one week after the injury were a puncture wound of the fat pad of the left index finger and cellulitis. A wet dressing was applied and the finger was immobilized with a splint. The puncture wound continued to drain, and penicillin was administered daily. The condition remained subacute for the next two months, although the adjacent middle finger became involved in the inflammatory process. Conservative treatment was continued until approximately ten weeks after the initial complaint, when the patient was hospitalized, and an amputation was performed through the proximal phalanges of the index and middle fingers. Healing was satisfactory. The pathologist's report of the microscopic sections (Figures 1 and 2) was: Obliterating endarteritis of the small blood vessels. Some of these were completely obliterated. There was some perivascular infiltration of the ground cells. Diagnosis: Thromboangiitis obliterans.

The results of general physical examination, including all indicated laboratory tests, were essentially negative. There was no evidence of scleroderma, scalenus anticus syndrome or cervical rib. Peripheral arterial pulsations recorded a week before amputation were as follows: The radials and posterior tibial artery pulsations were palpable.

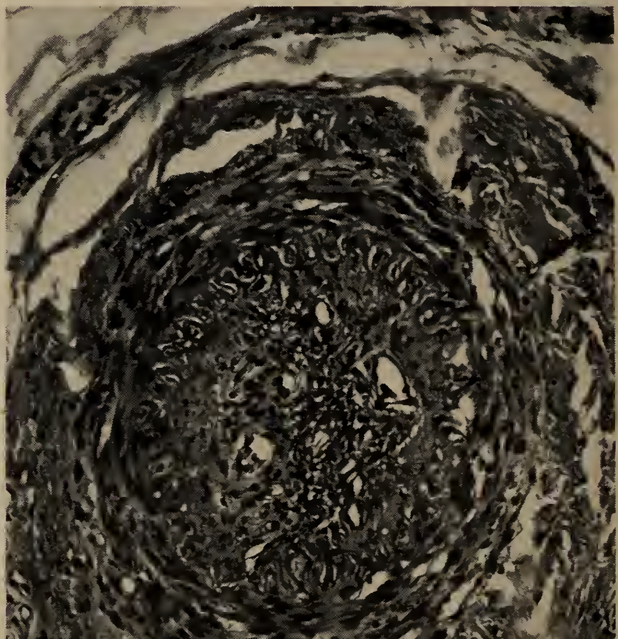

Figure 1.—Digital artery (x 200). This closely resembles Figure 95, "Old healed stage in small artery," in Buerger's text, "The Circulatory Disturbances of the Extremities," p. 343.

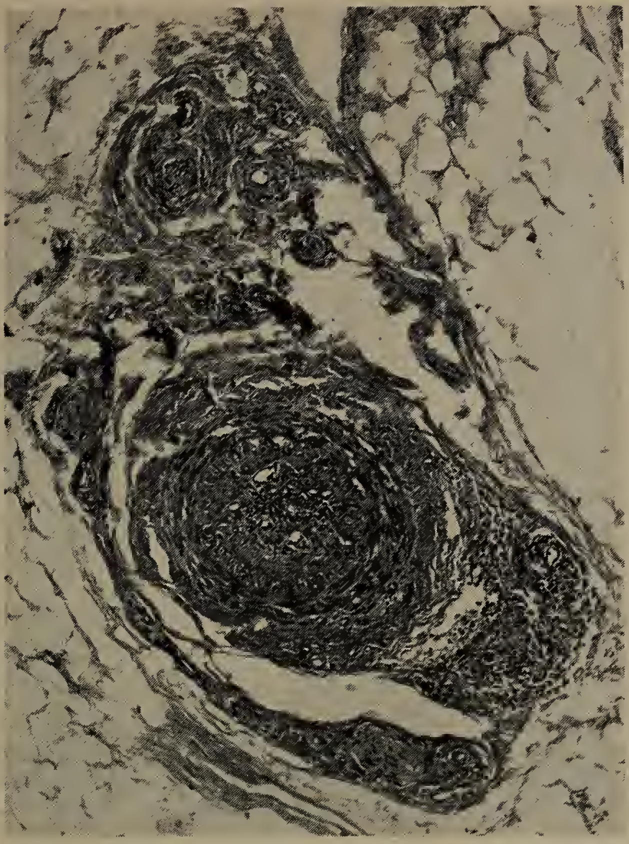

Figure 2.—Low power view (x 90) from section where Figure 1 was obtained.

but pulsations in the ulnar and dorsalis pedis arteries could not be felt. The patient, who had continued to smoke, was reexamined ten months later. The amputation sites were healed. The fingers and toes remained painful on exposure to cold, with color changes in the fingers, and there was still complaint of mild intermittent claudication in both calves on walking two to three blocks at a normal pace. The fingers were cold and dry, as were the feet. There were no postural changes. Palpable peripheral pulsations were as follows: The right dorsalis pedis was faintly palpable, but the left dorsalis pedis and both posterior tibials could not be felt. The popliteals and radials were normal and the ulnar arteries were not palpable.

COMMENT

The early diagnosis of Raynaud's disease in this case is understandable. The early symptoms were of a vasospastic character and resembled those of Raynaud's syndrome. Thromboangiitis obliterans was apparently not considered due to the lack of signs and symptoms of organic arterial occlusion. The subsequent course of events led to the correct diagnosis. Practically all the diagnostic criteria were present in this case, even the factor of smoking. The trauma which initiated the gangrenous process was unusual and open to controversy. As there were no strands in the telephone cable in question, the possibility of perforation of the skin by fine strands of wire was eliminated. It was found that 0.70 to 0.71 amperes at 24 volts direct current was periodically present about the telephone plugs and a mild shocking current could be felt, especially if the subject had moist hands. It is felt that a sufficient electrical current was present to cause cellular damage. Although the trauma that such a current might cause to normal tissues would be practically unnoticed, ischemic tissues, such as those present in this case, frequently respond poorly even to trivial trauma. This may have been a significant factor in this case.

CONCLUSIONS

A case of proven thromboangiitis obliterans in a white woman is reported.

An electric charge of 0.70 to 0.71 amperes at 24 volts direct current may have been the traumatizing agent in this case. Apparently sufficient damage was done to the ischemic tissues to precipitate a gangrenous process.

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The Use of BAL in Generalized Argyria

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HEAVY metal poisonings, especially the toxic effects resulting from gold,[2, 10] arsenic,[2] and mercury,[1, 4] have been successfully treated with BAL (British Anti-Lewisite, 2, 3-dimercaptopropanol). This drug was also discovered to be efficacious as an antidote in cadmium,[9] zinc,[13] copper,[6, 7] lead,[12] antimony, bismuth, chromium, and nickel poisonings.[1] No previous publication has been noted concerning the use of BAL in clinical argyria. The successful management of silver poisoning, whether local or generalized, has always remained a therapeutic problem. With the efficacy of BAL in other heavy metal toxicities a trial with this drug appeared indicated in a case of long-standing generalized argyria.

Arsenic, gold, and mercury, in particular, produce their toxic effects by combining with the sulfhydryl groups of tissue proteins of cellular enzymes to form mercaptides, thereby disrupting certain vital physiological processes. The sulfhydryl radical in dithiol BAL competes with the dithiol protein-metal compounds, thereby separating the offending metal from tissue union. To be effective, BAL must be administered soon after a heavy metal combines with the sulfhydryl group, otherwise the effect of the metal becomes irreversible.[10]

The distribution and metallic retention of silver in the body is very different from that of gold, arsenic, and mercury in the tissues. There is specific affinity of silver granules for the connective tissue framework and vascular system. In cases of argyria the reticulo-endothelial system is the site of the initial deposition, following which the majority of body structures contain silver deposits.[5] Silver, which is deposited as a colorless substance, is uniformly distributed in the corium and darkens as the result of light influence.[11] This metal so deposited remains chemically unchanged or is oxidized as silver oxide or silver sulfide, depending on the location. Gaul noted the distribution and agglomeration of silver particles as reciprocal to that of the capillary network with the metal lying free in the connective tissue.[3]

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The treatment of argyria has always been disappointing. Potassium iodide injections, methenamine, oral sodium thiosulfate, and local injections of 6 per cent sodium thiosulfate and 1 per cent potassium ferricyanide have been therapeutic failures. A substance which would combine with metallic silver in the tissues, leading to its consequent excretion, or one which would effectively but harmlessly cause its chemical reduction and have no disturbing side reactions would be a desirable therapeutic agent for patients with argyria. Olcott, using a limited number of experimental animals, discovered that BAL, even in large doses, was incapable of mobilizing silver.[8] However, a clinical trial with BAL appeared indicated in the following case of silver poisoning, even though the chronicity of argyria, and doubt as to whether silver is combined in the tissues with sulfhydryl groups of protein fractions of cellular enzymes, permitted little hope of success.

CASE REPORT

A white American male, 45 years of age, had had generalized argyria since 1932, resulting from intranasal administrations of 10 per cent silver nitrate or argyrol solutions for treatment of chronic vasomotor rhinitis. Medication was constantly employed by the patient for 17 years before the diagnosis was established, the average weekly dosage being an ounce. A bluish hue gradually developed over the upper part of the body so that the patient was suspected of having cyanosis from a cardiac disorder. By 1935, despite cessation of colloidal silver therapy, the skin of the patient had assumed a metallic silver color on the entire head and a slate gray color from the neck down to the mid-thorax together with localized areas on the dorsum of both hands and wrists. He had visited several eastern medical centers for treatment but met with no success, although the regimen of 6 per cent sodium thiosulfate and 1 per cent potassium ferricyanide was employed by local injections.

Physical examination of the patient on August 5, 1947, disclosed a well developed, well nourished male in no acute distress. He possessed a metallic silver pigmentation over the entire head and a slate gray color from the neck down to the xiphoid and on the wrists and dorsum of both hands. The buccal cavity and pharynx were also slate gray, and the tongue darkly shaded. Both ocular conjunctivae were slightly bluish-gray. A small area of herpes zoster was observed over the left subcostal region.

Erythrocytes numbered 5,100,000 with a hemoglobin value of 15.5 gm. per 100 cc. Leukocytes numbered 8,600 with 60 per cent neutrophils and 40 per cent lymphocytes. There was slight anisocytosis and poikilocytosis. The Kahn determination was negative. Results of a complete urinalysis were normal. Lack of facilities prevented determination of argyremia levels.

On September 2, 1947, BAL 10 per cent in 20 per cent benzyl benzoate in peanut oil was administered intramuscularly in especially large doses: 3.6 cc. six times daily for two days, then 3.6 cc. twice daily for ten days. Ephedrine sulfate in the amount of 25 mgm. was taken orally before each injection to suppress the disturbing side reactions like burning of the buccal cavity, increased lacrimation, nausea, epigastric distress, malaise, and pain over the injection site. Following this treatment schedule there was no change in the appearance of the patient. A similar course was given beginning November 18, 1947. except that 50 mgm. of oral pyribenzamine was employed to contrôl the side effects of BAL. In a three-month follow-up the patient's condition re- arsenic. and mercury poisonings.

SUMMARY

The case reported is one of generalized argyria which did not respond to intensive BAL therapy.

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California Cancer Commission Studies*
Chapter XXVI

Cancer of the Ovary and Fallopian Tube

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IT IS not surprising that the ovary, with its complex embryologic and evanescent cytologic nature, is so susceptible to tumor formation. No other organ undergoes the frequent periodic changes characterized by orderly growth, hypertrophy and regression. From this cytophysiologically active organ may arise tumors of all types, benign, malignant, primary, secondary, small, large, cystic, solid, papillary, smooth-walled, unilocular and multilocular. The clinico-pathologic picture is further confused by a paucity of symptoms and the absence of a standard system of classification and nomenclature. To aid in the early diagnosis and the successful treatment of ovarian neoplasms, the following brief data are presented.

INCIDENCE

Cancer of the ovary may develop at any age, but most frequently appears after the 40th year. Cancers at this site account for approximately 10 per cent of the malignant tumors of the female genital tract.

TYPES

Retention cysts: Benign retention cysts, either of follicular or corpus luteum origin, constitute a large proportion of all ovarian cysts. Occurring most frequently during the active reproductive years, these non-neoplastic cysts may attain 5-6 centimeters in diameter and become quite painful. Fortunately, most of these cysts spontaneously regress, but an occasional one may rupture with varying degrees of severity. In far too many cases operation is done and the normal ovary is needlessly sacrificed. It is this type of cyst that is "needled" or "surgically removed," as an afterthought, following other abdominopelvic operations. This meddlesome interference is not uncommonly followed by disturbances of the menstrual cycle, painful menstruation and other signs of ovarian trauma. Small cysts are an index of normal ovarian activity and should be let alone.

Fibroma: Usually small, firm, and unilateral, this benign tumor may produce the so-called Meig's syndrome, characterized by ascites and hydrothorax. This clinical entity is not infrequently misdiagnosed as an inoperable abdominal malignancy. The removal of the tumor is followed by a complete cure. Other types of ovarian tumor may produce the same clinical picture.

Endometriosis: Malignant changes in endometrial tumors of the ovary are rare. The "chocolate-cyst of Sampson," with its dense adhesions and pseudomalignant involvement of contiguous organs, may present a gross clinico-pathologic picture of true malignancy. Observation of the presence of other stigmata of endometriosis, such as implants on the peritoneal surface of the cul-de-sac or shotty nodules in the uterosacral ligaments, will assist in the correct diagnosis. Complete regression of inoperable areas will follow either surgical or radiation castration. Fortunately there is a definite trend to conservative surgical operation in the younger patient, with an attempt to preserve the reproduction function.

Teratomas: The dermoid tumor of cystic type is usually asymptomatic, contains relatively mature tissue and infrequently develops evidence of malignancy. Surgical conservation is indicated in most instances. The opposite ovary should be carefully examined for possible involvement.

The solid teratoma is extremely malignant, contains immature tissue, and, in contrast to the dermoid cyst, has a very rapid clinical course. This kind of tumor appears most frequently in the prepubescent individual and is usually fatal despite the most radical and complete forms of therapy.

The struma ovarii, a colloid-containing tumor belonging to the teratomatous group, may cause symptoms of hyperthyroidism. Histologically it looks like thyroid tissue. This tumor has a low malignancy rating.

The chorionepithelioma is also of teratomatous origin. It is highly malignant and the prognosis is grave. The Aschheim-Zondek test is frequently helpful in diagnosing the presence of this infrequent tumor. This tumor may occur in young children.

Cystadenomas: Comprising the largest group of ovarian neoplasms, the serous and pseudomicinous types of cystadenomas present difficult problems of diagnosis and treatment. Relatively slow-growing tumors until they acquire malignant characteristics, they may present a paradox in diagnosis, as it is not uncommon to find them grossly malignant and microscopically benign, and vice versa. The presence of intra- or extracystic papillary growths indicates potential malignancy. Although it is common practice to remove only the involved ovary in the young adult, the tendency to bilateral involvement is great and conservatism is often unwise. The selection of the correct type or extent of surgical procedure depends more upon the operator's judgment of the gross pathologic findings than upon anything else. All ovarian cysts should be carefully examined at the time of operation. Solid tumors should be studied by frozen sections.

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*Organized by the Editorial Committee of the California Cancer Commission.

When the papillary projections are friable the lesion is clinically malignant and radical excision is the procedure of choice. Naturally, the surgical procedure is governed by the accessibility of the pelvic organs and the experience of the surgeon. When possible, the entire uterus and adnexae should be removed. The value of intensive irradiation is questionable, although in some instances the rate of growth may be retarded. When it is impossible to remove the involved ovaries, adequate irradiation may be followed by a temporary regression of the clinical signs of malignancy. If regression occurs following irradiation some authorities advise a second abdominal operation to remove the primary malignancy. A disturbing problem arises when the pathologist reports malignant changes in a smooth-walled ovarian tumor diagnosed and treated as a benign process by the surgeon. In such instances it is advisable to observe the patient at frequent intervals and to advise immediate operation if the remaining ovary shows any change in size.

Primary carcinoma: Fortunately, the highly malignant primary solid cancer of the ovary is relatively infrequent. In the early and clinically silent stages, the involved ovary is usually well encapsulated, and complete removal is possible. Bilateralism is common, and cure is possible only if the entire uterus and adnexae are removed. However, the clinical course of tumors of this type is relatively rapid, and the operable case is usually discovered during routine examination by the alert physician. Even in the early stages distant metastases are possible, and the prognosis therefore should be stated guardedly.

Secondary carcinoma: The solid cancer of secondary type is more common in the ovary than the primary involvement of the ovary. Such tumors are usually bilateral, and the primary tumor, frequently small and symptomless, may be in the stomach, intestines, breast, or uterus. Contiguous and lymphatic spread from the uterus is not infrequent and is thus another indication for total hysterectomy in the surgical treatment of ovarian cancer. The Krukenberg type usually has its origin in the stomach, although other parts of the gastro-intestinal tract are possible sites. The removal of the ovaries has little therapeutic value unless the primary tumor also is removed. The presence of bilateral ovarian tumors predicates a thorough study of the gastro-intestinal tract before operation is undertaken.

Recently, study of the gastric washings by the Papanicolaou-Traut technique has aided the diagnosis in the presence of bilateral ovarian tumors and the absence of gastro-intestinal signs.

SPECIAL TUMORS

Of interest are the relatively rare ovarian tumors capable of producing striking effects upon the sex characteristics of the individual. The following tumors are listed:

Granulosa cell tumors—tumors of the feminizing type—may produce sexual and somatic precocity in the prepubescent individual. In the sexually mature adult the signs of hyperesterinism caused by such tumors are less spectacular, although abnormal and heavy menstrual periods are quite frequent results. The presence of an ovarian tumor and hyperplasia of the endometrium is presumptive evidence of this type of tumor. In postmenopausal patients ovarian resurgence is indicative. Accruing statistics indicate definite malignant tendencies in tumors of this type.

Theca cell tumor, although closely related to the granulosa cell tumor, produces less hormonal disturbances, and since it occurs most frequently in the older age group, the problem of ovarian conservatism is of little import.

Dysgerminoma or the neuter type occurs most frequently in the young and sexually immature adult. Although clinical pseudo-hermaphroditism has been commonly observed in patients with dysgerminoma, it is now recognized as a coexisting state rather than a result of the tumor. Thus, tumors of this kind cause no clinically diagnostic symptoms. The tumor is considered moderately malignant.

Arrhenoblastoma or the masculinizing type may be clinically confused with the rare "adrenal-like cell tumor" of the ovary, adrenal cortical tumor and the so-called "Cushing syndrome." The presence of hypertrichosis and poorly developed secondary sex characteristics are not necessarily clinical evidence of this type of tumor. Rather, they may represent the individual's response to her own normal glandular influences. The characteristic clinical picture is one of defeminization followed by masculinization. The more immature forms of the tumor are definitely malignant.

SYMPTOMS

It should be constantly kept in mind that in the early stages there are no pathognomonic signs or symptoms by which malignant tumors of the ovary can be excluded as a possibility. Many patients are unaware of a tumor until its presence becomes noticeable by the increase in the size of the abdomen or they are able to palpate it through the abdominal wall. Pain is the most common symptom and is often in the hypogastrium; when the pain is located low in the pelvis it may herald the stage of ineradicable extension. Disturbances of menstruation do occur, and, when associated with palpable ovarian neoplasms, the presence of endometrial disease should be considered. While ascites, loss of weight and cachexia are usually considered indications of inoperability, it is not too uncommon to find the triad in the presence of a microscopically benign process amenable to present methods of treatment. The functionally active tumors produce clinical symptoms characteristic of their individual types.

DIAGNOSIS

The first step in treating suspected ovarian malignant disease is to establish the diagnosis, and this is possible only by an abdominal operation. This procedure should be carried out even in cases in which the tumor appears clinically to be malignant, as occasionally it will prove benign on microscopic examination. Rarely can tissue for diagnosis be obtained by cul-de-sac puncture or by paracentesis, with examination of the abdominal fluid for tumor cells. It is better to drain the ascites with a small incision than with a trocar, as the latter, like the peritoneoscope, may puncture the encapsulated neoplasm and spill the contents. Even when the abdomen is opened, the diagnosis is not always clear-cut. However, as a rule, a cyst of the ovary, if smooth, non-adherent, encapsulated, and unilocular, will be benign.

As in all surgical procedures the removed organ should be opened at once and the inner surfaces examined for papillary projections. While intracystic papillary growths are not always indicative of malignancy, it is best to regard them as a malignant process. Tumors that are cystic in some areas and solid in others are liable to be malignant; cysts with internal or external papillary excrescences, and all solid tumors, except the fibroma, should be suspected of malignancy. Any cyst or tumor with nodular irregular contour should be regarded with suspicion.

These rules, like all such dogmatic rules, are applicable only in the majority of instances. The cytologic interpretation is not always easy and it is not uncommon to have experienced pathologists disagree on the diagnosis. The importance of widespread distribution of the neoplasm to other parts of the abdomen is difficult to evaluate, especially when the primary tumor is of the cystadenomatous type. A guarded prognosis is wise even when the microscopic picture is one of benignity. It is well to remember that in most types of ovarian cancer there are no pathognomonic symptoms or signs and the essential early diagnosis is only possible through routine preventive examination. This means all women should have periodic pelvic examinations.

TREATMENT

There is general agreement that treatment should be by surgical removal whenever possible. In some instances it is possible to make apparently inoperable tumors operable by preoperative irradiation. However, it is well to bear in mind that nothing is gained, and often harm is done, by over-irradiation. In the presence of widespread metastases, marked improvement in general health and retardation of the malignant process may follow the removal of the primary focus. When the process is unilateral and without evidence of extracystic involvement, conservation of the remaining grossly normal ovary in the young adult is a common practice. This is not without danger and the patient should be examined frequently for many years afterward. If uterine bleeding is present the possibility of an endometrial malignancy should be ruled out. If the tumors are bilateral, primary focus in the gastro-intestinal tract should be searched for before any form of treatment is undertaken. The decision of treatment at the time of operation is not always easy, but when the process is obviously malignant the procedure of choice is the removal of the entire uterus and adnexae. However, operation in the presence of ovarian cancer is not without danger. Perforation of the intestine and bladder during operation is not uncommon and all probable sites of such accidents should be doubly checked before the abdomen is closed. Decision as to ovarian conservation should be guided by the age of the patient and the gross appearance of the tumor.

PROGNOSIS

There is no field in gynecology in which prognosis is more uncertain than it is in dealing with ovarian tumors. Permanent results following complete surgical removal of the malignant process are not strikingly satisfactory, as a large percentage of the patients die within two years after operation; and the five-year salvage is depressingly poor. Generally speaking, the cystic forms are less malignant and more amenable to treatment; they tend to regress following the removal of the primary focus. Prognosis should always be guarded, as it is not uncommon for a microscopically benign form to recur and metastasize. A satisfactory salvage can be attained only by early diagnosis, immediate and adequate operation and, when indicated, maximum irradiation. Early diagnosis is possible only through routine preventive examinations, a course too rarely advocated and practiced by the profession and too frequently unheeded by the laity.

SUMMARY

It is not necessary to remove the ovary because of the presence of benign non-neoplastic cyst which may be evidence of temporary disturbance of the ovarian follicle or corpus luteum.

All ovarian cysts should be opened at once for signs of intracystic growth. All solid tumors should be studied by immediate frozen section.

Proper treatment demands early diagnosis, which is possible only through abdominal operation. Solid and semi-solid tumors, cysts with irregular nodular contour, or with intra- and/or extracystic papillary excrescences should be suspected of malignancy. Cysts that are smooth, non-adherent, and unilocular are usually benign.

If it is possible to do so, the entire uterus and the adnexae of patients having malignant cysts or solid tumors of the ovary should be removed. Although irradiation is still of debatable value, it will retard the rate of growth in some instances.

Routine complete examinations will improve the present poor salvage rate. A cyst that either regresses or remains constant in size should be kept under observation. A cyst or tumor that increases in size should be removed.

The incidence of correct diagnosis will vary in direct ratio to the surgeon's knowledge of gross pathologic appearances, and the type or extent of treatment depends on this knowledge.

The relatively rare ovarian tumors of a type causing aberration of function usually result in characteristic clinical pictures of hormonal imbalance and for the most part are to be considered malignant.

Cancer of the Fallopian Tube

Carcinoma of the fallopian tube is a clinical curiosity in general practice. Because of its rarity, the difficulty of diagnosis and the unsatisfactory status of therapy, the prognosis invariably is bad. It occurs more commonly after the 40th year and accounts for 0.5 to 1 per cent of the malignant lesions of the female genital tract.

TYPES

Primary carcinoma occurs most frequently as a papillary type of adenocarcinoma. In approximately 70 per cent of the cases reported in the literature it occurred as a unilateral lesion.

Secondary carcinoma: More frequent than the primary form, the secondary type commonly arises from the cervix, endometrium, ovary and sigmoid colon.

SYMPTOMS

The danger of this lesion lies in the absence of any characteristic signs or symptoms. Occasionally the presence of an excessive watery sanguineous vaginal discharge is suggestive in the absence of active foci of inflammation. In most cases the sign-symptom complex of tubal cancer does not differ materially from that caused by other adnexal diseases.

DIAGNOSIS

The diagnosis is rarely made prior to operation. The presence of a soft, doughy, unilateral tubal mass in a woman near menopause should be interpreted as suspicious, and surgical intervention is the wise procedure. The true nature of the lesion is frequently overlooked at operation, as the process resembles either a pyosalpinx or hydrosalpinx. For this reason it is advisable to open the tubes for examination as soon as they are removed.

TREATMENT

Radical removal, if possible, of the internal genitalia and parametrium is the procedure of choice. Care should be taken not to rupture the involved tube. Although the value of irradiation is unknown, maximum roentgen therapy is advised.

PROGNOSIS

The infrequency of early diagnosis, the tendency to treat the disease as an inflammatory process, thus wasting valuable time, and the probable radioresistance, all combine to make the prognosis of tubal carcinoma very unsatisfactory. As with all types of genital cancer, it is curable only if treated in the early stages.

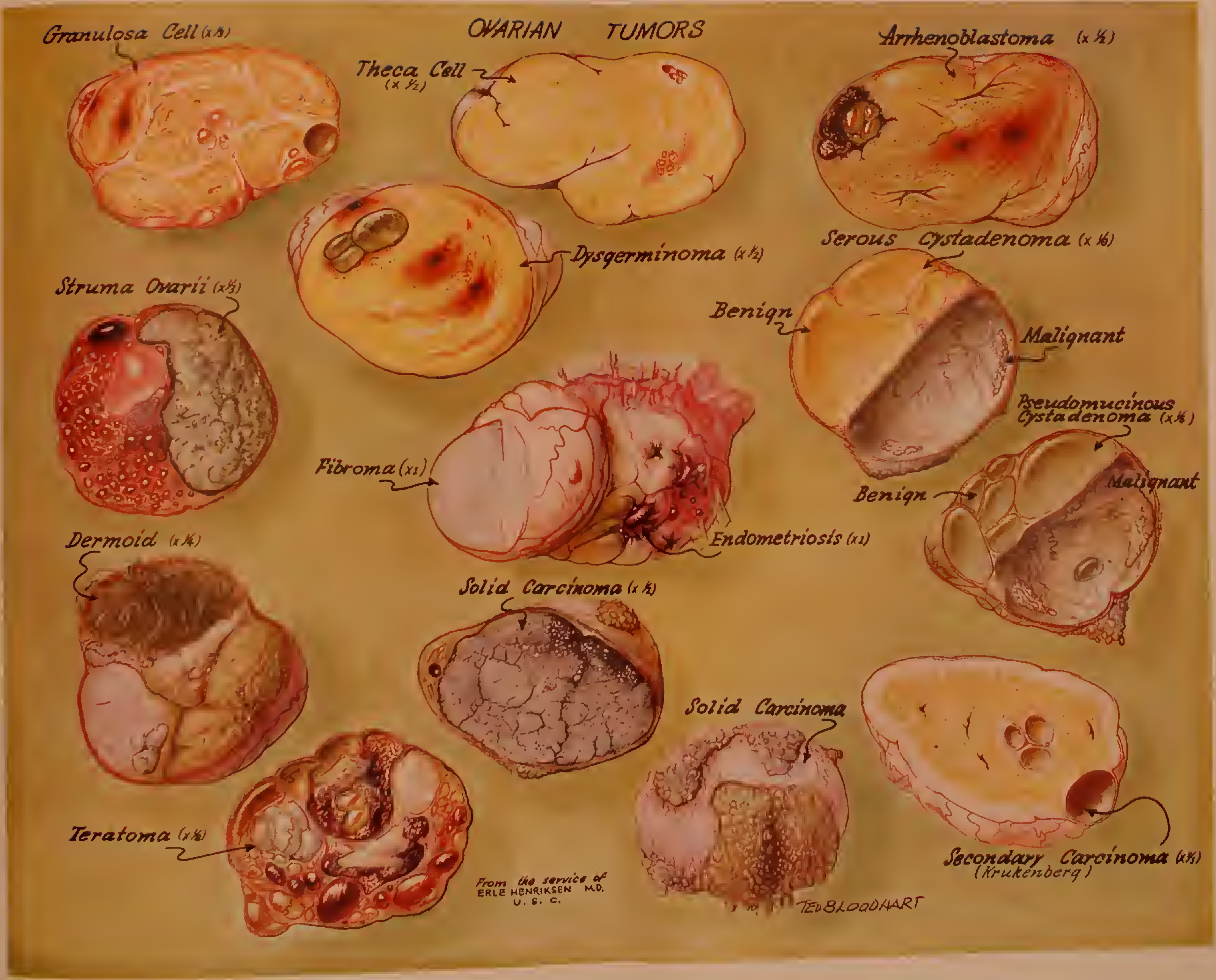
SUMMARY

Cancer of the fallopian tube is rare. It is frequently overlooked at the time of operation because the process resembles either a pyosalpinx or hydrosalpinx.

The presence of a soft, doughy, unilateral tubal mass should rouse suspicion of tubal cancer.

The treatment of cancer of the fallopian tube is radical removal of the internal genitalia and parametrium if possible.

"Skin Cancer" by Henry F. Ullmann, M.D., Chapter X of the California Cancer Commission Studies, will appear in this section of the March issue of California Medicine.


OVARIAN TUMORS
Granulosa Cell (x⅓)
Theca Cell (x ½)
Arrhenoblastoma (x ½)
Dysgerminoma (x ½)
Serous Cystadenoma (x ⅙)
Struma Ovarii (x⅓)
Benign
Malignant
Pseudomucinous Cystadenoma (x⅙)
Fibroma (x1)
Benign
Malignant
Endometriosis (x1)
Dermoid (x¼)
Solid Carcinoma (x ½)
Solid Carcinoma
Teratoma (x⅙)
Secondary Carcinoma (x⅓)
(Krukenberg)
From the service of
ERLE HENRIKSEN M.D.
U. S. C.
TED BLOODHART

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EDITORIALS

Industrial Medical Fees

Back in 1912, California adopted a workmen's compensation law, which provided that a workman injured in the course of his employment should become a charge against the employer. The law stated that the employer must provide the injured employee with full medical and hospital care and must also pay compensation to him to offset the loss of wages caused by the accidental injury. The physicians of that day were opposed to this new law, seeing in it a beginning of regimentation for the profession.

In the 36 intervening years, compensation insurance has grown to a large industry in California and total insurance premiums, not including the cost of self-insurance by large employers, run to more than $40,000,000 a year. Each injury requires medical attention and it has well been said that the physician is the keystone of the entire industrial accident structure. Nonetheless, we sometimes wonder if the doctors of 1912 weren't really right in their opposition to the original statute.

It seems that over the period of years the doctor has been the forgotten man in the care of industrial accidents. He provides the medical care. He evaluates the injury from the point of view of loss of time, loss of function and loss of potential wages. His diagnosis and prognosis may make or break an insurance underwriter. Yet, he is the one cog in the industrial accident machinery which cannot act of and by itself. If he thinks he is entitled to a higher fee for his services, he must politely put his hat in his hand and ask permission from the insurance companies. And the underwriters are in business to make money, not to pay doctors. Hospitals, surgical supply houses, pharmacists and nurses may increase their fees or charges and the higher amounts are paid by the insurance companies; the doctor is always told that there is a fee schedule in effect which limits his fee. In many cases, his services are solicited at fees 25 to 50 per cent less than the established schedule. Occasionally, in exceptional circumstances, he is paid more than the printed schedule, but these occasions are few and far between.

Ever since 1914 the Industrial Accident Commission of the State of California has maintained a schedule of medical and surgical fees as a guide to both doctors and employers. Originally brief, with only a few procedures listed, the schedule was augmented and the fees increased late in 1946, *after the California Medical Association had put in more than four years in the effort.* The increase in fees at that time was bitterly opposed by some insurance carriers; to the credit of others, some were agreeable to the adoption of fees more nearly in line with 1946 than with 1924, the date of the then existing schedule.

Again in 1948 the C.M.A. asked the Industrial Accident Commission to review the fee schedule now in effect and submitted a proposed schedule of fees believed to represent more nearly a fair level as of this time. The Commission has now tabled the Association's petition and in doing so has adopted a resolution which holds that the Commission has no "authority to enforce any medical fee schedule adopted by it." The California Medical Association does not hold the same belief, but since the Commission is the only official body which has ever published a fee schedule which has been recognized statewide, the Commission's own beliefs must prevail.

The ruling of the Industrial Accident Commission went one step beyond the tabling of the current petition. It called for the abandonment of the present fee schedule after June 30, 1949. Thus in one breath the Commission has ruled that it has no authority to enforce "any medical fee schedule" and that it will enforce the present schedule until next June 30. It seems reasonable to ask, if the Commission believes it now has no authority to enforce a fee schedule, how it can enforce the present one until next June 30.

Acting on this reasoning and the Commission's ruling, the Council of the C.M.A. has voted that a copy of the 1948 proposed schedule of fees be sent to every Association member, with the suggestion that these fees be applied in all industrial accident cases on and after February 1, 1949. If the Industrial Accident Commission has no authority to enforce a fee schedule, and no intention of doing so, chaos is the only result we can foresee when the present schedule is dropped.

The Council's move is intended to place the members of the Association in a proper position to bargain individually with insurance carriers when the lid is taken off industrial fees and the sky becomes the limit. The Association has worked long and hard to produce a schedule of fees which are believed to be fair and equitable in these cases; it is not asking anything exorbitant but it is asking that fair and just fees be recognized. The laborer is certainly worthy of his hire.

Copies of the new proposed schedule have been sent to all members. If additional copies are needed, they may be had on request. If they are used by the doctors of the state, an adjustment of industrial accident medical and surgical fees may be realized without the formality and indignity of the hat-in-hand petitioner who, like Oliver Twist, is only asking enough to sustain himself.

* * *

Hospital Districts and Acorns

The village smithy stood in the shadow of a spreading chestnut tree; this from a lowly chestnut once did grow. Innumerable events historic have transpired in and about the lordly oak, which we are told from a minute acorn grew.

It is less than five years since the kernel of the hospital district idea first appeared upon the horizon medical. The following is the growth to date in this one state alone:

Estimated number of hospital districts	36
Bond issues authorized to date	18
Bond issues rejected to date	2
District hospitals actually operating	5
District hospitals under construction (blueprints and up)	12
Hospital districts proposed	10

The small hospital for the rural community of size sufficient to support a hospital is obviously a most worthy project. The small hospital, like the large hospital, often reflects the quality and conscience of the directing board, plus the ability of the staffing physicians. It will come as a shock to many physicians to learn that in the five district hospitals now in operation there is not a single physician on the board of directors. It will come as a further shock to learn that these boards are appointed politically and elected politically. Such method of appointment and election *may* result in excellent directors, but in the absence of any medical guidance, the reverse is obviously true.

The following are the district hospitals now in operation:

Location	*Name*	*Bed Capacity*
Pittsburg	Pittsburg Community Hospital	70
Crescent City	Seaside Hospital	29
Coalinga	Coalinga District Hospital	22
Bishop	Northern Inyo Hospital	12
Hemet	Hemet Valley Hospital	25

Many physicians are aware of the fact that osteopaths in this state carry licenses often equivalent to those granted M.D.'s. Such osteopaths are especially numerous in our southern sector. Some have their own hospitals; some are on the staffs of existing hospitals and some are demanding representation on the boards of, or rights of admitting patients to, the new district hospitals. When the staff of a hospital has some control over the policies and practices in that institution, and when that staff is made up of experienced physicians, the safety of the patients is engendered. Under other circumstances, their safety may not be protected as much as fully trained physicians would prefer.

Before sponsoring the creation of additional hospital districts, or the enlargement of district hospitals now in operation, physicians might do well to pause and reflect upon the acorn.

Letters to the Editor . . .

Editor's Note: This review by an outstanding Californian of the biography of a remarkable California woman is of such general interest that it is published here in full.

Psychologist Unretired; The Life Pattern of Lillien J. Martin. By Miriam Allen deFord, Stanford University Press, 1948, $3.00.

Lillien J. Martin (1851-1943) was not only a psychologist of international reputation but was one of the most remarkable women that America has produced. Other women in this country (though not many) have been more eminent in science, other women have been more widely acclaimed for their social services, their philanthropies, their feminism, or their political activities, and there may be others who have remained as alert and energetic into the 90's; but I know of no one who was so outstanding in all of these respects and others.

Consider the many things in which she was first or near-first. She was the first woman teacher of physical sciences in the high schools of Indianapolis; the first woman to head a science department in a San Francisco high school; the only woman in this country who ever changed her vocation to psychology after the middle forties; the first woman permitted to study psychology at the University of Göttingen; the only woman psychologist to be awarded an honorary Ph.D. in psychology by a German university; the first woman to be elected vice-president of the American Association for the Advancement of Science; one of the first four or five women psychologists to become a starred scientist; the first woman anywhere to open an old-age counseling center; the only professor I have ever known, man or woman, who took up an entirely new field of work after reaching the age of retirement, who pursued it for more than a quarter-century, and who accomplished more important work and achieved more eminence after 65 than in all the preceding years. And what other woman ever learned to drive a car after the age of 78, or to type by the touch system after the age of 80? What other woman ever traveled alone so extensively in Soviet Russia after 80, or in practically all the countries of South America after the age of 88?

All this and much more is recounted by Miss deFord in this extremely interesting biography. There are many things in the story that were new to me, despite the fact that I was a member of the Stanford faculty for six years before Dr. Martin "retired" to her new career. I too was teaching psychology at Stanford, but at that time in another department of the university, and I was working with mental tests, which Dr. Martin then regarded as hardly a legitimate field of psychological research. Little did I dream that she would later completely reverse herself on this issue, that she would devote a good part of her last year at Stanford to mastering Binet testing procedures, and that she would use these and other psychometric devices for 27 years after her "retirement"!

Lillien Martin was a precocious child, active, energetic, and determined. She began teaching, in order to earn her college expenses, shortly after graduating from an academy at 16. At 25 she took the examination for admission to Vassar and passed with such high honors that she was awarded a four-year scholarship. From the time of her graduation at 29 until she had reached the age of 43 she was a high school teacher of science. Then some reading in psychology, plus encouragement from one of her friends, led her to burn all her bridges and to prepare for a career in psychology. She resigned her position and left for Europe, where she studied for four years at Göttingen with the distinguished psychologist G. E. Müller. Later she returned to Germany several times and studied at the University of Würzburg in 1907, at Bonn in 1908, and at Munich in 1914. It was Bonn that awarded her an honorary Ph.D. degree in 1913.

Her career as a teacher of psychology began in 1898, when she was appointed assistant professor at Stanford immediately after her return from Germany. She was then 47 years old. By the time she became professor emeritus in 1916 she had published some 20 technical articles, a majority of them in German periodicals and in the German language. The story of her work as a student in Germany and as a member of the Stanford faculty is well told in two chapters written for the biography by Dr. J. Harold Williams, who had been one of her graduate students from 1912 to 1914.

When Dr. Martin left Stanford at the age of 65 she began planning for herself an entirely new career as a private practitioner in clinical psychology, among the first in the United States to enter that now popular vocation. Within a year she had opened a clinic in her San Francisco apartment and was soon kept busy with the problems of maladjusted children. Later she opened mental hygiene clinics at two San Francisco hospitals, giving her forenoons to directing them and reserving her afternoons and evenings for private practice. In 1920, at the age of 69, she inaugurated a special clinic for the psychological examination of normal preschool children, one of the first in the country.

For several years Dr. Martin's work was almost entirely with children, but the problems of children led naturally to the problems of parents and grandparents, and as the years passed a larger and larger proportion of her clients were old people. It was in 1929, when she was 78, that she opened her old age counselling center, the first of its kind in America, if not in the world. This she directed for the rest of her life in close association with Mrs. Clare Moore deGruchy. During its first ten years the center had more than a thousand clients, and by 1943, the year of Dr. Martin's death, the number had risen to nearly three thousand. From the age of 78 until her death at almost 92, Dr. Martin devoted the greater part of her time to pioneering in the psychological problems of gerontology. New and ingenious methods were developed which proved highly successful in the rehabilitation of hundreds of old people by giving them new interests, new attitudes, new skills, and new hope. Her methods may have been based on "inspired common sense," as the biographer puts it, but they worked so effectively that they have been widely copied by others.

In a brief review it is impossible to give the reader an adequate idea of Dr. Martin's energy and devotion to causes. I have said nothing about her feminist and political activities, about the cooperative farm she conducted between the ages of 82 and 86 for the rehabilitation of old men, about her work with shell-shocked veterans of World War I, about her training 129 high school girls during the depression, to prepare them for positions in child care, about her long-continued work among the Chinese in San Francisco, or about her three valuable books on old age and old age counselling.

It has fallen to the lot of few people to be remembered so gratefully by so many, and for such good reasons. Her entire life was one of continuous maturation and of unceasing learning. That she never grew old must surely be explained in part by the fact that her life was so filled with devoted service to others.

LEWIS M. TERMAN

Professor of Psychology and Education
Emeritus, Stanford University

C. P. S. Fee Schedules

San Francisco

Editor, CALIFORNIA MEDICINE

Dear Sir:

The returns from the statewide survey, conducted by the California Physicians' Service fee schedule committee for the purpose of determining changes in the schedule requested by physician-members, have been tabulated.

We want the county medical societies, specialty groups and individuals who responded to our survey in such a gratifying manner, to know of the committee's appreciation, and to have the assurance that the thought and effort that we put into our recommendations to the C.P.S. board of trustees will match their own, with elimination of inequities and modernization of the schedule as the chief objectives.

Very truly yours,

W. L. BENDER, *Chairman*
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NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 357th Meeting of the Council

San Francisco, December 18-19, 1948.

The meeting was called to order by Chairman E. L. Bruck at 9:30 a.m., Saturday, December 18, 1948, at the Fairmont Hotel.

Roll Call:

Present were President Askey, President-elect Kneeshaw, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Anderson, Ray, Bruck, Lum, Pollock, Green, Cherry, MacLean, Shipman, Bailey and Thompson; Councilors ex-officio, Secretary Garland and Editor Wilbur.

Absent (illness): Councilor Hoffman. A quorum present and acting.

Present by invitation were Dr. Dwight H. Murray, legislative chairman; John Hunton, executive secretary; William P. Wheeler, assistant executive secretary; Howard Hassard, legal counsel; Ben H. Read, executive secretary of the Public Health League of California; Ed Clancy, field secretary; Clem Whitaker, public relations counsel; county society executive secretaries Joseph Donovan of Santa Clara County, Frank J. Kihm of San Francisco County, Rollen Waterson of Alameda County, Stanley K. Cochems of Los Angeles County and Glen Gillette of Fresno County.

Present by invitation during a portion of the meeting were Dr. John W. Cline, chairman of the California delegation to the A.M.A.; Dr. Frederick N. Scatena, secretary, and Dr. William F. Quinn, president of the State Board of Medical Examiners, and Dr. Lowell S. Goin, president of the Board of Trustees of California Physicians' Service.

1. *Minutes:* Minutes of the 356th meeting of the Council, held October 30-31, 1948, were approved.

2. *Membership:*

(a) A report of membership as of December 17, 1948, was received. This showed 9,153 active members, 83 Associate members and 455 members listed as delinquent because of non-payment of dues. It was pointed out that the number of delinquent members represented a readjustment of memberships following the end of the allowable period of dues waivers for members in military service, that many of these members had not returned to the state following their military service. It was agreed that the Committee on Membership and Organization should be advised of this fact and requested to make mention of it in its annual report.

(b) On motion duly made and seconded, 17 members whose 1948 dues had been received since the previous Council meeting were reinstated as active members.

(c) On motion duly made and seconded in each case, 10 applicants were elected to Retired Membership. These are:

H. Robert Dykes, Sr., Kern County.
J. C. Drake, Fresno County.
W. F. Cornett, Los Angeles County.
William Edler, Los Angeles County.
Claude G. Greengo, Los Angeles County.
Louis K. Guggenheim, Los Angeles County.
James B. Luckie, Los Angeles County.
L. A. J. LaMotte, Los Angeles County.
F. L. McLeod, Los Angeles County.
John V. Craviotto, San Joaquin County.

(d) On motion duly made and seconded, Dr. E. M. Wilder of Sacramento County was elected to Life Membership.

(e) On motion duly made and seconded in each case, Philip M. Morgans of Orange County and Frederick A. Franke of San Francisco County were elected to Associate Membership.

(f) On motion duly made and seconded, a reduction of dues because of illness was granted to Newell Moore of Orange County.

Attention was called to a conflict between the provisions of Article IV, Section 1(f) and Article XI, Section 1(c) of the Constitution, as amended 1948. The earlier section provides for the election, at the discretion of the Council, of inactive members who shall pay no dues and the latter section for the reduction of dues in special cases. On motion duly made and seconded, it was voted that the intent of the Council was to consider applications in such cases as coming within the scope of Article XI, section 1(c) and to consider the other article dormant at this time.

(h) It was regularly moved, seconded and voted that the provisions of Article XI, section 1(b) of the Constitution, relating to the waiver of dues for war service, be made applicable to members serving in the military reserves who are called into active military service.

3. *Financial:*

(a) A report of bank balances as of December 16, 1948, was received and ordered filed.

(b) A balance sheet as of November 30, 1948, was received and ordered filed.

4. *Memorial to Philip K. Gilman:*

The executive secretary reported that the Stanford Medical School has created a "Philip K. Gilman Memorial Revolving Fund" and that the Association's contribution of $1,000 to that fund has been sent. The fund will be augmented by other contributions and will be used as a self-renewing loan fund to enable graduate students, especially in surgery, to continue their studies where otherwise they might be compelled to discontinue them because of lack of finances.

5. *New Mexico Physicians' Service:*

A letter from New Mexico Physicians' Service was read, in which request was made for technical assistance from California in evaluating and placing on a sound basis several operating procedures of N.M.P.S. Inasmuch as the Association does not maintain a staff qualified in such matters, it was regularly moved, seconded and voted to refer this request to California Physician's Service. It was also agreed that Dr. Paul R. Hawley of Associated Medical Care Plans be advised of this action and that the C.P.S. representatives be urged to visit New Mexico at the same time Dr. Hawley plans to be there on other business.

6. *Cancer Commission:*

1. Dr. John W. Cline reported for the Cancer Commission, outlining the procedure whereby 40 per cent of funds collected in the public drives goes to national headquarters for research purposes and 60 per cent is retained for use in the state and county organizations. In addition, he asked the Council to establish a policy on: (a) The retention of a full-time medical director for the Cancer Commission and the California division of the American Cancer Society (b) the formation of county branches of the American Cancer Society where such branches do not now exist, and (c) the establishment of fund-soliciting organizations in counties where no branches of the A.C.S. exist.

(a) On motion duly made and seconded, it was voted that the duties of the medical director of the Cancer Commission and the California division of the American Cancer Society did not appear to require full-time work and that the medical director's salary should be revised accordingly, one-half to be paid by the Cancer Commission if funds were not otherwise available.

(b) On motion duly made and seconded, it was voted that a letter be sent to those county medical societies where county branches of the California Division, American Cancer Society, do not exist urging the formation of county branches.

(c) On motion duly made and seconded, it was voted that county branches of the Women's Field Army of the American Cancer Society should not be formed for the solicitation of funds in counties without A.C.S. branches unless the county medical society has approved the formation of a county branch of A.C.S.

2. Dr. Cline also brought up the question of publishing the Cancer Studies of the Cancer Commission, which have been running in article form in the official journal. Mention was made of the fact that the state printer might possibly be authorized, through the State Department of Public Health, to share in the cost of binding these studies. On motion duly made and seconded, it was voted that the Cancer Studies of the Cancer Commission should be published by the Association. (An amendment to provide for the state printer sharing in this work was defeated.)

3. Dr. Askey reported the resignation of Dr. Orville Meland as a member and as Southern California secretary of the Cancer Commission. He tendered the appointment of Dr. Ray B. McCarty of Riverside to succeed Dr. Meland as a member and Dr. Eric Larson of Los Angeles as Southern California secretary, and the Council confirmed these appointments.

7. *Advisory Planning Committee:*

Mr. Hunton reported that copies of the Brookings Institution publication, *The Issue of Compulsory Health Insurance,* had been purchased and would be sent to every secondary school and college library in the state as a reference work.

Mr. Hunton reported on the recommendation of the committee that Ed Clancy, field secretary of the Association, and Glen Gillette, executive secretary of the Fresno County Medical Society, be appointed as members of the committee. On motion duly made and seconded in each instance, they were voted appointment.

Mr. Clancy presented copies of a proposed manual on public relations to be sent to all members, to the press and to members of the Legislature. After study of the manual the Council voted (December 19) that this manual be printed with each member's name printed on the cover and distributed at the earliest possible date.

8. *Other Organizations:*

(a) Sister Kenny Foundation—A report from a committee of the San Francisco County Medical Society which has been reviewing this organization with a view toward cooperation was read and it was decided that no action by the Council was indicated at this time. It was also agreed that the special Council committee to review the status of voluntary medical welfare organizations (Cline, chairman; Wilbur, MacLean, Askey and Alesen) be urged to draw up general standards for a basis of approval of such groups and suggested policies for same.

(b) American Public Health Association—Dr. Bruck read a report rendered by Dr. William Palmer Lucas of San Francisco, Council appointee to attend the annual meeting of this organization. The report showed that a new section on medical care had been voted by a vote of more than three to one and that its proponents were dominant in the affairs of the meeting. On motion duly made and seconded, it was voted to file this report and to thank Dr. Lucas for his services.

(c) A letter from the Alameda County Medical Association, requesting clarification on the duties of health officers, was read. Mr. Rollen Waterson, Dr. Donald Lum and a representative of the State Department of Public Health were requested to submit their views in writing to the Secretary, who was then to forward this material to Dr. Cline's committee for preparation of a report for the Council.

9. *Legal Department:*

Mr. Hassard reported on a meeting of the hospital and clinic committee of the Welfare Council of Greater Los Angeles, at which it was voted to urge legislation to permit the employment of physicians on a salary basis by sanatoria and other hospitals which furnish medical care on a charity basis and which, under a recent ruling of the State Attorney General, might be unable to provide care without enabling legislation. On motion duly made and seconded, it was voted that a committee be appointed (Kneeshaw, Askey, Hassard) to prepare a resolution on this subject.

The committee submitted the following resolution, which was moved, seconded and adopted:

Resolved, That the California Medical Association favors an amendment to the Medical Practice Act empowering the State Board of Medical Examiners, at its discretion, to approve employment of doctors of medicine by such sanatoria, clinics and other institutions as are found by the Board to be operated and conducted exclusively for eleemosynary and charitable purposes, and which make no charge to patients for medical services rendered.

Drs. Marshall L. Skaggs and William B. Neff, anesthesiologists, appeared before the Council to urge consideration of the position of their specialty in consideration of the solution of the problem of employment of physicians by hospitals. It was pointed out that a state supreme court ruling in a case governing employment of anesthetists by hospitals indicated the need for deferring action on their specialty until conclusion of negotiations regarding pathologists and others.

Mr. Hassard reported that a specimen contract between hospitals and radiologists had been drawn and the Council voted to appoint a special committee to consider this. This committee reported (December 19) that it approved the specimen contract submitted and it was regularly moved, seconded and voted that the committee's (Garland, chairman; Pollock, Alesen) report be accepted.

10. *Delegates to American Medical Association:*

(a) Dr. John W. Cline, chairman of the Association's delegation to the A.M.A., reported on the steps taken by the A.M.A. at the St. Louis Interim Session, November 30-December 1, 1948, including:

(1) Transfer of the Washington office from the Council on Medical Service to the Board of Trustees;

(2) Establishment of a Planning Committee consisting of four members of the Board of Trustees, three members of the House of Delegates and three officers (ex-officio), to handle A.M.A. planning to meet threats of political medicine.

(3) Expansion of the Washington office by additional personnel, space, etc.

(4) Appointment of a committee of the A.M.A. Board of Trustees to furnish direct supervision over the Washington office; and

(5) Establishment by the A.M.A. of an assessment of $25 per active member to furnish a fund for public educational purposes.

Other members of the California delegation pointed out that Dr. Cline was one of the three members of the House of Delegates appointed to the planning committee and that Dr. Dwight H. Murray of California, a member of the Board of Trustees of the A.M.A. and California chairman of Public Policy and Legislation, had been named chairman of the Trustees' committee to supervise the Washington office. It was also pointed out that the public relations firm of Whitaker and Baxter, public relations counsel for the C.M.A., had been selected to establish the public educational campaign.

On motion duly made and seconded, it was unanimously voted that the Council is deeply grateful to the Association's Delegates to the A.M.A. under the able chairmanship of John W. Cline for the fine work achieved at the A.M.A. St. Louis meeting and wishes to spread its commendation on the minutes of this meeting.

(b) Dr. Murray reported that the A.M.A. had requested the services of James J. Boyle, Washington representative of the United Public Health League, as a staff member of its Washington office and that he, as chairman of the board of directors of the League, had approved this transfer, subject to the approval of the directors of the League.

(c) It was moved by Crane, seconded by Alesen, that the California Medical Association pay to the American Medical Association the full amount of the assessment of $25 per member for all A.M.A. members in California. After considerable discussion, it was regularly moved, seconded and voted that this motion be tabled.

11. *Public Relations:*

Mr. Whitaker reported that 95,000 signatures have been validated for an initiative petition which would ban all use of animals in medical research in California and that the proponents of the measure have until January 20, 1949, to validate and file an additional 110,000 signatures to place the measure on the ballot.

Mr. Whitaker also reported on the staging of "California Caravan," the Association's radio program from San Francisco on December 5, in honor of the Irwin Memorial Blood Bank of one of the component county medical societies and on the occasion of the annual meeting of the Radiological Society of North America in California.

12. *Public Policy and Legislation:*

(a) Drs. William F. Quinn, president, and Frederick N. Scatena, secretary, appeared for the Board of Medical Examiners and presented a series of amendments to the Business and Professions Code which the Board wishes to see introduced in the 1949 Legislature. Mr. Hassard reported that a committee of medical school deans was working along similar lines, particularly as regards educational requirements. After discussion it was regularly moved, seconded and voted that a committee be appointed to meet with the Board of Medical Examiners and the medical school deans to work out proposed legislation. The committee was named as Drs. L. R. Chandler and Dwight H. Murray and Mr. Hassard.

It was regularly moved, seconded and voted to express the thanks of the Council to Drs. Quinn and Scatena for conferring with the Council on these matters.

(b) Councilor MacLean asked that the Council approve a proposed amendment to Section 11493 of the Insurance Code, to permit non-profit hospitalization corporations to indemnify members against the cost of professional services outside of hospitals. It was regularly moved, seconded, and voted that a special committee consider this matter. (The committee, MacLean, Murray, Hassard and Goin.) The committee reported December 19 that it agreed to the proposed amendment, provided changes were made as follows: (1) hospital care, and indemnification for any and all professional services to be separated into two different sections; (2) hospital care to be authorized under present capital and reserve provisions of Chapter 11a; (3) medical and surgical indemnity to be authorized only if the Chapter 11a plan meets the capital and reserve requirements of a disability insurance company under the regular provisions of the Insurance Code.

(c) Dr. Dwight H. Murray, chairman of the Committee on Public Policy and Legislation, reported that Governor Warren would probably introduce health insurance legislation in the 1949 Legislature and that the committee would follow previous instructions to oppose such measures.

He also reported that the California State Nurses Association had asked support for a measure it proposed to introduce to provide training and licensure for practical nurses. It was pointed out that a copy of this measure had not yet been furnished by the nurses and that efforts to confer with them on this proposed bill had not been successful. It was agreed that if further efforts to meet with nurse officials on this bill failed, the legislative committee should draft a bill of its own along these lines and present it to the Executive Committee for confirmation.

Mr. Hassard reported on a hearing by the Senate interim committee on professional and vocational standards, which held a public hearing on December 13, at which time committee members announced their intention of introducing legislation to provide penalties for the giving or accepting of rebates for the reference of patients.

Mr. Hassard also reported on several problems associated with hospital construction under terms of existing laws. It was agreed that further discussion would be held following the Council's recess.

13. *Recess:*

At this point, 6:00 p.m. December 18, 1948, it was voted to recess until 9:30 a.m., December 19. 1948.

14. *Reconvention:*

The meeting was called to order by the chairman at 9:30 a.m., Sunday, December 19, 1948. at the Fairmont Hotel, San Francisco.

Roll Call.

All members of the Council were reported present on roll call. In addition, all those invited and present on December 18 were present, except Drs. Cline, Quinn, and Scatena and Mr. Joseph Donovan. Present by invitation during a portion of the meeting were the members of the Board of Trustees of California Physicians' Service and Mr. William M. Bowman, Executive Director of C.P.S.

A quorum present and acting.

15. *Public Policy and Legislation:*

Dr. Murray proposed that the Association adopt a positive legislative program to include: (a) licensure of laboratories using animals in their work; (b) training and licensure for practical nurses; (c) support for anti-rebating legislation; (d) support or advocacy of amendments to the Medical Practice Act in line with recommendations of the Board of Medical Examiners, medical school deans and Association representatives; and (e) support of the voluntary movement to provide health insurance. On motion duly made and seconded, the Council voted to adopt this as the official program of the Association for a positive legislative program for 1949.

Dr. Askey reported on meetings he and Dr. Alesen have held with representatives of the California Osteopathic Association and it was regularly moved. seconded and voted that they continue such meetings and report to the Executive Committee in January.

16. *California State Department of Public Health:*

(a) Dr. Wilton L. Halverson, State Director of Public Health, appeared before the Council and discussed in detail the recommendations proposed to be made by the committee of the Department which has been studying the problem of chronic diseases. Various suggestions were offered and accepted for the proposed report and the report as amended was regularly moved, seconded, and voted approval.

(b) Dr. Halverson explained that a successor was needed for the late P. K. Gilman as director of the Bureau of Hospitals of the Department and that civil service requirements must be met. He asked for suggestions for this post.

(c) Dr. H. G. MacLean reported on replies received to inquiries regarding the metropolitan area x-ray survey for tuberculosis proposed by the U. S. Public Health Service. In cities where these surveys have been made, it appears there is adequate provision for the reference of positive cases to private physicians and that there is cooperation between the physicians and the U.S.P.H.S. staff. On motion duly made and seconded, it was voted to approve the making of such a survey in selected metropolitan areas of California.

In this connection, it was pointed out that the reliability of such surveys is questioned by some authorities and, further, that in Minneapolis, where such a survey has been made, 40 per cent of those people discovered to have active tuberculosis were found one year after the survey to have refused proffered hospitalization. Dr. Halverson stated that legislation would be offered to strengthen the position of health officers in requiring hospitalization in such cases.

(d) Dr. Bruck read the recommendations of the heart committee for the chronic disease survey and these were approved.

17. *American Medical Association Assessment:*

On motion by Cherry, seconded by Shipman, it was voted to lift from the table the motion presented the previous day (item 10(c) above) relative to payment to the American Medical Association of the sum of the A.M.A. assessment of $25 for each A.M.A. member in California. It was pointed out that this payment should be considered as a gift by the California Medical Association on behalf of its members.

It was regularly moved and seconded that the California Medical Association make a gift, from available funds, to the American Medical Association in the amount of $25 for each active member of the Association. The motion was carried by majority vote, Councilors Thompson, Anderson and Pollock requesting that their negative votes be recorded. The chairman did not vote.

The Executive Secretary requested instructions as to the manner in which this gift should be forwarded to the A.M.A. It was moved and seconded that the Secretary send a check to the American Medical Association in the sum of $25 for each active member of the Association as of December 1, 1948. Mr. Hassard suggested that the Secretary and Chairman of Board of Trustees of the American Medical Association be contacted to insure the acceptance of this payment as a gift from the Association and in return grant a remission of the $25 assessment to A.M.A. members in California; this suggestion was adopted by the mover and seconder and incorporated in the original motion. The augmented motion was then adopted by majority vote. Councilor Thompson asked that his negative vote be recorded; the chairman did not vote.

It was pointed out that the Association did not have on hand sufficient funds to carry out the motion just passed but that such funds would have to be made available to the Association by the Trustees of the California Medical Association. The Council voted to recess to permit the Trustees of the California Medical Association to hold a meeting.

(The Trustees of the California Medical Association voted to transfer $228,825 to the California Medical Association in their meeting, Drs. Thompson, Anderson, MacLean, Lum, Bruck and Pollock asking that their negative votes be recorded.)

18. *Industrial Accident Commission:*

Dr. Donald Cass, chairman of the Committee on Industrial Practice, reported that the Industrial Accident Commission of the State of California had denied the petition of the Association for adoption of a revised schedule of fees to apply in industrial accident cases. The denial was made on grounds that the Commission lacked specific legal authority to make and enforce a schedule of fees; at the same time, the Commission's resolution stated that the existing fee schedule would be considered as in force only until June 30, 1949. It was pointed out that if the Commission lacked authority to make and enforce a fee schedule, it did not have authority to enforce an existing fee schedule for any additional period of time. It was moved, seconded and unanimously voted that the schedule of fees presented to the Industrial Accident Commission be adopted as a recommended schedule for use by all Association members, that copies of it be sent to all members with the suggestion that it be put into effect by all members on February 1, 1949.

19. *Public Policy and Legislation:*

Mr. Hassard reported the suggestion of Dr. Murray that the Council appoint a Chronic Disease Commission and recommend to the House of Delegates that such a commission be regularly maintained. It was regularly moved, seconded and voted that such action be taken.

It was reported that a committee was to meet December 21 to consider the introduction of legislation to provide for the licensing and inspection of laboratories using animals, to insure proper handling of such animals and to prevent illicit use of animals. The Association has been invited to be represented at this meeting and it was agreed that a representative be named.

20. *Secretarial Conference:*

The Secretary reported that the dates of February 4 and 5, 1949, set for the Secretarial Conference, were in conflict with other meetings. It was regularly moved, seconded and voted that the Secretary be empowered to set this meeting later in the year.

21. *State Department of Education:*

A request for the naming of representatives to participate in conferences on Rural Life and Education, sponsored by the California State Department of Education, was read and it was regularly moved, seconded and voted that such representatives be named.

22. *Kings County Health Officer Request:*

A letter from the health officer of Kings County was read, asking suggestions for selection and method of working with neuropsychiatrists in cases coming before the juvenile court. It was agreed that a reply be sent, suggesting that the county confer with a private neuropsychiatrist as a consultant and that the families of the juveniles pay for private services if they were able, otherwise the juvenile court to assume the costs.

23. *California Physicians' Service:*

Dr. Lowell S. Goin, president of the Board of Trustees of C.P.S., took the chair and introduced Trustees C. L. Cooley, H. Randall Madeley, Donald Cass and A. E. Moore, Mr. C. Ray Miller and Mr. Ransom M. Cook, and Mr. William M. Bowman, executive director.

Mr. Bowman reported that C.P.S. as of November 30, 1948, had more than $1,000,000 cash on hand and a unit stabilization fund of $745,705.90. He also explained a simplified billing form which will be distributed to member physicians in March.

Dr. Madeley reported that the Board of Trustees had voted to increase the unit value to $2.15, effective January 1, 1949, an increase of about $700,000 annually. Dr. Cooley reported 9,500 physician members and about 700,000 beneficiary members of C.P.S. and other Trustees spoke on Blue Cross cooperation, liaison with county medical societies and a survey of members of one county society to determine their reaction to C.P.S. The survey report showed a favorable view of voluntary medical care insurance among the physicians polled.

24. *Time and Place of Next Meeting:*

It was agreed that the next meeting be at the call of the chairman, the dates of February 19 or February 26, 1949, being suggested.

Adjournment.

L. HENRY GARLAND, M.D.
Secretary

In Memoriam

BASCOM, FRANCIS SENTER. Died in Piedmont, December 23, 1948, aged 46, of a heart attack. Graduate of Harvard Medical School, Boston, 1929. Licensed in California in 1930. Doctor Bascom was a member of Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

DUNN, THOMAS BALFOUR. Died in Fresno, December 28, 1948, aged 62. Graduate of the University of California Medical School, Berkeley-San Francisco, 1916. Licensed in California in 1916. Doctor Dunn was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

HAWLEY, CARL JOHN. Died in Van Nuys, December 26, 1948, aged 44. Graduate of the University of Southern California School of Medicine, Los Angeles, 1935. Licensed in California in 1935. Doctor Hawley was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

HOLEMAN, GEORGE STEVENSON. Died in San Jose, December 8, 1948, aged 61. Graduate of the University of Oregon Medical School, Portland, 1921. Licensed in California in 1921. Doctor Holeman was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

JONES, ELLIS WILLIAM. Died in Los Angeles, December 4, 1948, aged 64. Graduate of Harvard Medical School, Boston, 1911. Licensed in California in 1913. Doctor Jones was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

KIMBALL, ARCHIE PERCIVAL. Died in San Diego, December 2, 1948, aged 63, of cancer of the right ureter. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1908. Licensed in California in 1944. Doctor Kimball was a member of the San Diego County Medical Society, the California Medical Association, and the American Medical Association.

✣

KIRK, JOSIAH HERMAN. Died in Palo Alto, December 8, 1948, aged 69. Graduate of the Cooper Medical College, San Francisco, 1906. Licensed in California in 1906. Doctor Kirk was a member of the Santa Clara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

SPAULDING, JOHN M. Died in Los Angeles, November 13, 1948, aged 67. Graduate of the University of Louisville School of Medicine, Louisville, Kentucky, 1907. Licensed in California in 1923. Doctor Spaulding was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

WHELPLY, FRANK RAYMOND, JR. Died in Long Beach, November 24, 1948, aged 55. Graduate of the University of Buffalo School of Medicine, Buffalo, New York, 1918. Licensed in California in 1948. Dr. Whelply was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

The blood bank of the Alameda County Medical Association recently moved into newer and larger quarters at 354 Hobart Street, Oakland. Increasing demand for whole blood at hospitals served by the bank necessitated removal from Alta Bates Hospital where facilities were overloaded. The new quarters, which are specifically designed for blood banking, are capable of handling three times as many donors as the former location.

BUTTE-GLENN

Dr. Concessa Graviotto of Oroville has been elected president of the Butte-Glenn Medical Society for 1949, Dr. C. K. Hubbard, vice-president, and Dr. J. O. Chiapella, secretary-treasurer.

* * *

Dr. William L. Adams, Jr., of Fresno, has been elected president of the Fresno County Medical Society for 1949, succeeding Dr. K. D. Luechauer. Dr. C. P. Doane was named president-elect to succeed to the presidency in 1950. Other officers elected for 1949 are Dr. W. N. Knudsen, first vice-president; Dr. C. S. Mitchell, secretary-treasurer; Dr. D. H. Trowbridge, librarian. Dr. Luechauer was elected to the board of governors of the society; Dr. E. E. Hawley, delegate to the California Medical Association, and Dr. W. H. Gilliatt as alternate.

LOS ANGELES

Dr. Benjamin M. Frees was named president of the Los Angeles County Medical Association for 1949 in the annual balloting-by-mail election held late in 1948. Dr. Clarence J. Berne was elected vice-president, and Dr. Richard O. Bullis was reelected secretary.

In addition, the Committee on Elections declared the following elected to office: Trustee (five-year term) Dr. William H. Leake; Councilorship No. 1 (three-year term) Drs. Wilbur Bailey, Elmer J. Ball, Frank G. Crandall, Jr., Eugene F. Hoffman, and J. Lafe Ludwig; Councilorship No. 6 (three-year term) Dr. Charles H. Cowgill; Councilorship No. 7 (three-year term) Dr. Ralph T. Smith; Councilorship No. 8 (three-year term) Dr. Lawrence M. Hill.

* * *

Appointment of Dr. Lowell S. Goin of Los Angeles to the National Advisory Cancer Council for a three-year term was announced recently by Surgeon General Leonard A. Scheele of the U. S. Public Health Service. As a member of the Council, Dr. Goin will help formulate plans and policies of the National Cancer Institute and review applications from non-federal institutions for aid in cancer control and research.

* * *

At the annual election of officers of the Los Angeles Society of Allergy (a section of the Los Angeles County Medical Association) the following officers were elected for 1949: Dr. Hyman Miller, president; Dr. Frank G. Crandall, Jr., vice-president; Dr. M. Coleman Harris, secretary-treasurer. The new officers were installed at the January meeting of the society.

RIVERSIDE

At the annual installation meeting of the Riverside County Medical Society held last month at Soboba Hot Springs, Dr. Harold M. F. Behneman was installed as president and Dr. Phillip Corr as vice-president. Dr. Cecil Lord retained the post of secretary-treasurer.

SAN FRANCISCO

At the sixteenth annual meeting of the Stanford Medical Alumni Association, Dr. Frank Gerbode was elected president, Dr. Henry Newman vice-president, and Dr. Lowell Rantz secretary-treasurer.

SONOMA

At a recent meeting of the Sonoma County Medical Society, Dr. Alexis Maximov of Santa Rosa was installed as president for 1949 and Dr. William J. Newman of Sonoma was named president-elect. Other officers elected were: Dr. William J. Rudee, Santa Rosa, secretary-treasurer; Dr. Clifford M. Carlson and Dr. Raimond F. Clary, both of Santa Rosa, members of the executive committee. Dr. Maximov and Dr. Donald C. Oakleaf were elected delegates to the annual meeting of the California Medical Association, with Dr. Cuthbert M. Fleissner and Dr. Roscoe L. Zieber as alternates.

TULARE

Dr. W. B. Parkinson of Porterville has been elected president of the Tulare County Medical Society to serve for the coming year. Dr. J. E. Feldmeyer of Exeter was elected vice-president, and Dr. Wiley Zinc of Tulare, secretary-treasurer. Dr. Parkinson and Dr. W. A. Winn were elected to represent the county society as delegates to the California Medical Association, with Dr. S. S. Ginsburg and Dr. J. H. Brady of Visalia as alternates.

YOLO

Dr. Emery Leivers of Woodland has been elected president of the Yolo County Medical Society for 1949. Dr. Frank J. Peter, Woodland, was elected vice-president, and Dr. Charles McKinney, of Davis, secretary-treasurer.

GENERAL

At the annual meeting of the Radiological Society of North America in San Francisco in December, Dr. Lowell S. Goin of Los Angeles and Dr. Edward Chamberlain of Philadelphia (formerly a member of the faculty of Stanford School of Medicine), were awarded gold medals by the society in recognition of conspicuous service to science. The presentation was made by Dr. L. Henry Garland, San Francisco, outgoing president.

New officers of the society for 1949 include Drs. Edgar McNamee, Cleveland, president; Warren Furey, Chicago, president-elect; Laurence Robbins, Boston; Earl Miller, San Francisco, and James Collins, Indianapolis, vice-presidents;

Howard Doub, Detroit, librarian; and Eugene Prendergrass, Philadelphia, chairman of the board of directors.

* * *

At a recent meeting of the Southern California Chapter of the International College of Surgeons, Dr. Rafe Chaffin, Los Angeles, was elected president, Dr. Charles W. Shirey, North Hollywood, vice-president, and Dr. J. James Duffy, Los Angeles, secretary-treasurer.

* * *

More than 52,000,000 people, or well over one-third of the total population of the United States, are now protected under some form of voluntary hospital expense insurance, while voluntary surgical expense and medical expense plans, newer types of protection, cover approximately 26,000,000 and 9,000,000 respectively, according to a report by John H. Miller, chairman of a committee formed by a number of insurance companies which has just completed a survey of voluntary accident and health plans in this country. The figures include not only those individuals protected by insurance companies but also those covered by the Blue Cross and all other types of organizations providing this protection.

* * *

An attack by osteopaths on the validity of medical licensure laws in Kansas has been thwarted, at least temporarily, by a recent ruling of a special three-judge federal court.

In an action brought by osteopaths in the state, with the aid of the American Osteopathic Association, to have set aside the state's restrictions governing the practice of osteopathy, the court unanimously ruled against the plaintiff. In denying the petition, the court said, in part:

"It is peculiarly within the province of the State of Kansas to classify and regulate the right to pursue a calling or profession having to do with the public health. The nature of the classification and the requisite qualifications for license to pursue a profession within such classification must largely depend upon the judgment of the state."

Observers believe the plaintiff will appeal to the United States Supreme Court for final ruling.

* * *

Federal government grants totaling $9,244 for research in medical and related scientific fields were made recently to three California institutions. California Institute of Technology, Pasadena, was awarded $6,069 for study of the polarization state of nervous tissue; University of California at Berkeley, $2,635 for research on antagonism to transplants as influenced by the physiological need of the host for the engrafted tissue; University of Southern California, $540 for studies on the action of drugs and metabolites on the isolated heart.

* * *

Of some 162,000 California veterans given medical treatment for service-connected disabilities or diseases in 1948, about half were treated by physicians in private practice under the "home town" medical care program, with the remainder handled by Veterans Administration staff physicians in VA out-patient clinics, according to a report by the Veterans Administration. For 81,163 patients treated by private physicians under this program, the average number of treatments per patient was 4.84. Among the 81,323 patients given medical care at VA clinics, the number of subsequent visits was considerably lower, with an average of only two treatments per patient.

Private physicians were paid $1,452,606 for 393,300 treatments under the home town plan, or an average of $3.69 per treatment. Figures as to cost of treatments given by VA staff physicians are not available, the agency said, as there is no way of computing charges on a comparable basis.

Medical Films - Annual Session

Facilities will be available for showing 16 mm. sound or silent films at the 1949 Annual Session of the California Medical Association to be held in Los Angeles May 8 to 11. To select films suitable for showing and to make up a program for their showing, a special committee has been named by the Committee on Scientific Work.

Any member who has one or more films available for this showing should contact Dr. Conrad J. Baumgartner, 409 N. Bedford Drive, Beverly Hills. Films should be shipped to Dr. Baumgartner for viewing by the committee. They should be sent as soon as possible and in no case later than April 1, 1949.

INFORMATION

Poliomyelitis in California - 1948

The incidence of poliomyelitis in California for 1948 as reported to the State Department of Public Health has well exceeded that of previous years. In total numbers of reported cases, the figure for 1948 has surpassed that of 1934, the previous highest recorded incidence, by more than two thousand cases. Even with the sharp increase of population in the state in recent years, the case rate per 100,000 population for 1948 exceeded that of 1934 (see Table 1).

Table 1.—*Poliomyelitis—Reported Cases and Case Rates for Selected Epidemic Years 1934-1948*

Year	*Cases*	*Case Rates**	*Estimated Population*
1934	3,396	54.8	6,077,046
1939	973	14.3	6,815,130
1943	2,650	34.0	7,795,000
1946	2.164	23.4	9,250,000
1948	5,796	58.6	9.894,000

*Case rate per 100,000 population.

Cases of poliomyelitis are reported throughout the year in California, although there is the usual seasonal rise in incidence during the summer and early fall. Incidence peaks have occurred as early as June and as late as October. Following the 1946 epidemic with its peak in August and a total of 2,164 cases for that year, a high endemic level was maintained throughout 1947 and a total of 865 cases was reported for that year. At the beginning of 1948, the lowest number of cases within the previous 20 months was reported for January (13 cases). For the next two months, although the number of cases was not great, the rate of increase was showing a precipitous climb. However, the epidemic curve flattened out somewhat in April only to begin a steep upward swing again in May. A continuing increase in cases occurred in the following months, June showing approximately three times as many cases as May, and July cases trebling the June total. In August there were almost half again as many cases reported as in July, while the peak of the epidemic was reached in September with 1,437 cases reported for that month. The monthly totals of cases for August, September, October, November and December, 1948, were the highest on record for these months (see Table 2).

Of the 58 counties in the state, four did not report a single case of poliomyelitis for 1948. These counties are Alpine, Del Norte, San Benito and Sierra. Southern California, south of the Tehachapi mountain range, accounted for 3,850 cases or approximately 66 per cent of the total reported, while Los Angeles County reported by far the greatest number (3,134). The San Francisco Bay Area including the six counties, Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Solano, reported 761 cases or approximately 13 per cent of the total, while the central valley counties, some 16 in number, from Kern County in the south to Tehama in the north, accounted for another 13 per cent (775 cases). The remaining 410 cases (8 per cent) were reported for the most part from among the central and northern coastal counties, with a few from those counties along the Sierra Nevada mountain ranges.

The distribution of poliomyelitis cases by counties by month of report (January-December) 1948 is shown in Table 3 (on following page).

Table 4 shows the percentage distribution of reported cases of poliomyelitis by age groups for the year. A similar distribution is made of 261 poliomyelitis deaths recorded from January to October, 1948.

Table 4.—*Distribution of Poliomyelitis Cases and Deaths Among Various Age Groups*

	Cases Jan.-Dec.		*Deaths Jan.-Oct.**	
Age Group	*No.*	*Per Cent*	*No.*	*Per Cent*
Under 1 yr.	168	2.9	6	2.3
1-4	1,697	29.4	39	14.9
5-9	1,588	27.5	41	15.7
10-14	680	11.8	35	13.4
15-19	367	6.4	24	9.2
20-24	381	6.6	40	15.3
25-29	430	7.4	31	11.9
30-34	252	4.3	30	11.5
35-44	180	3.1	13	5.0
45-54	22	0.4	2	0.8
55 and over	10	0.2	......	......
Total with ages	5,775	100.0	261	100.0
Not stated	21			
Totals	5.796		261	

*Data on deaths for November and December not yet available.

Table 2.—*Poliomyelitis—Seasonal Distribution of Reported Cases by Month of Report, Selected Epidemic Years 1934-1948**

Years	*Total*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
1934	3,396	25	27	18	38	314	1,193	767	430	225	182	103	74
1939	973	27	15	18	23	53	253	473	533	620	308	228	99
1943	2,650	4	4	3	6	29	48	150	257	189	138	105	40
1946	2,164	54	20	24	19	34	67	198	693	562	303	111	79
1948	5,796	13	8	23	9	71	225	671	938	1,437	948	921	532

*Civilian cases only.

The age pattern shows a majority of cases (60 per cent) in the group under ten years of age with the 1-to-4 year age group containing the highest number of cases and the 5-to-9 year age group the next highest. In the groups above the age of ten, 18 per cent of the cases fall into the 10-to-19 age group, whereas over 22 per cent are in patients 20 years of age or older. The age distribution of the recorded deaths reveals that 44.5 per cent fell into the age group 20 and over, whereas only 22 per cent of cases fell into this group.

No attempt has been made to present a breakdown of cases according to clinical patterns because of incomplete data at this time. A more comprehensive report will be made in the near future as soon as complete data are at hand.

TABLE 3.—*Poliomyelitis Distribution Among Counties in 1948*

County	*Total*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
Alameda	185	----	1	5	----	1	1	8	15	37	49	42	26
Alpine	----	----	----	----	----	----	----	----	----	----	----	----	----
Amador	2	----	----	----	----	----	----	----	----	----	----	----	2
Butte	8	----	----	----	----	----	----	3	----	3	2	----	----
Calaveras	----	----	----	----	----	----	----	----	----	----	----	----	----
Colusa	1	----	----	----	----	----	----	----	----	----	----	1	----
Contra Costa	111	----	----	----	2	1	1	2	16	29	24	21	15
Del Norte	----	----	----	----	----	----	----	----	----	----	----	----	----
El Dorado	8	----	----	----	----	----	----	----	3	1	----	4	----
Fresno	115	----	----	----	----	2	9	13	15	24	16	15	21
Glenn	5	----	----	----	----	----	----	----	5	----	----	----	----
Humboldt	18	----	----	----	----	1	----	----	2	7	4	2	2
Imperial	48	----	----	----	----	6	19	13	5	3	2	----	----
Inyo	4	----	----	----	----	----	----	----	2	----	----	----	2
Kern	233	----	----	----	----	----	1	7	4	53	36	83	49
Kings	41	----	----	----	----	----	----	1	5	10	----	7	18
Lake	1	----	----	----	----	----	----	----	----	----	----	1	----
Lassen	5	----	----	----	----	----	----	----	----	----	2	1	2
Los Angeles	3.134	4	4	7	4	23	108	377	582	874	480	477	194
Madera	15	----	----	----	----	1	2	2	1	2	2	2	3
Marin	37	2	----	----	----	4	3	3	2	14	4	2	3
Mariposa	1	----	----	----	----	----	----	----	----	1	----	----	----
Mendocino	7	----	----	----	----	----	----	----	1	2	3	1	----
Merced	67	----	1	1	----	19	11	15	4	6	4	6	----
Modoc	4	----	----	----	----	----	----	----	2	1	1	----	----
Mono	1	----	----	----	----	----	----	----	1	----	----	----	----
Monterey	44	----	----	----	----	----	----	1	11	12	5	11	4
Napa	10	----	----	----	----	1	----	----	----	2	1	3	3
Nevada	4	----	----	----	----	----	----	----	----	1	2	----	1
Orange	102	----	----	----	----	1	2	9	20	37	16	11	6
Placer	13	----	----	----	----	----	----	----	5	1	2	2	3
Plumas	1	----	----	----	----	----	----	----	----	----	1	----	----
Riverside	81	----	----	1	1	4	7	5	20	7	16	5	15
Sacramento	82	----	----	----	----	----	----	4	3	22	23	19	11
San Benito	----	----	----	----	----	----	----	----	----	----	----	----	----
San Bernardino	82	----	----	----	----	----	7	22	14	16	8	9	6
San Diego	340	----	----	2	----	2	19	97	68	77	41	19	15
San Francisco	284	1	----	4	----	3	3	26	21	41	72	65	48
San Joaquin	74	----	----	----	----	2	2	8	9	14	11	21	7
San L. Obispo	14	----	----	----	----	---	----	1	2	1	7	2	1
San Mateo	105	----	----	----	----	----	2	6	10	24	23	24	16
Santa Barbara	99	----	----	----	----	----	1	8	17	38	19	11	5
Santa Clara	91	----	----	----	1	----	2	2	7	26	37	3	13
Santa Cruz	21	1	----	1	----	----	----	1	1	7	1	5	4
Shasta	1	----	----	----	----	----	----	----	----	----	----	----	1
Sierra	----	----	----	----	----	----	----	----	----	----	----	----	----
Siskiyou	4	----	----	----	----	----	----	----	2	----	----	1	1
Solano	39	3	1	----	----	----	----	2	10	8	6	3	6
Sonoma	31	----	----	----	----	----	7	3	9	----	1	8	3
Stanislaus	66	1	----	1	---	----	14	9	15	8	6	7	5
Sutter	10	----	----	----	----	----	----	----	1	1	4	1	3
Tehama	1	----	----	----	----	----	----	----	----	----	----	----	1
Trinity	1	----	----	----	----	----	----	----	----	----	----	1	----
Tulare	38	----	----	----	----	----	2	7	4	4	6	6	9
Tuolumne	3	----	----	----	1	----	----	----	1	1	----	----	----
Ventura	63	----	----	----	----	----	1	9	17	8	8	14	6
Yolo	11	1	----	----	----	----	----	1	3	4	----	1	1
Yuba	8	----	----	----	----	----	----	1	----	1	2	3	1
*Not allocated	22	----	1	1	----	----	1	5	3	9	1	1	----
Totals	5,796	13	8	23	9	71	225	671	938	1,437	948	921	532

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*Cases "Not Allocated" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

The New Birth and Death Certificates

Wilton L. Halverson, M.D., Dr.P.H., *State Director of Public Health*

Revised certificates for registration of live births, stillbirths and deaths were distributed to all physicians, hospitals and funeral directors in California for use beginning January 1, 1949. These forms were adopted in connection with the decennial revision of the standard certificates as worked out by the National Office of Vital Statistics through conferences with registration officials from each of the states.

The certificates for live birth and stillbirth are essentially unchanged. They present no problem to the physician, and require no discussion here, with a single exception. This is the provision on both certificates of an item for birth weight. It is believed that this information will be of great service to those studying the problem of prematurity.

The revision of the certificate of death brings a major change in the section "Cause of Death" to conform to recommendations of the World Health Organization. Mortality statistics have been as accurate as the original medical certifications of cause on which they stand, modified by treatment given these records by the statistical office. Both factors in this equation can now operate more efficiently and more to everyone's satisfaction.

As will be seen in the certificate section reproduced below, there is now a clear separation of the cause-of-death statement into Parts I and II with more specific explanations for each part. A great deal of history and thought is represented in this revision.

"Cause of death" is now defined as the condition, disease process, abnormality, injury or poisoning leading directly or indirectly to death. Symptoms or modes of dying such as heart failure or asthenia are not considered to be causes of death for statistical purposes. The problem of classifying causes of death for vital statistics is relatively simple when only one cause is involved, but in many cases two or more conditions contribute to death. Traditionally, one of these causes has been selected for vital statistics and described with little uniformity as the "primary cause," "principal cause," et cetera. The "Manual of Joint Causes" has been utilized since 1914 for arbitrary selection of the statistical cause of death. It is now obsolete and will no longer be used.

It was agreed by the revision conference that the "cause" to be tabulated hereafter should be the underlying cause of death. In the past this cause too has been selected in various ways in different countries. The principle now adopted defines the underlying cause of death as (a) the disease or injury which initiated the events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury. To assure uniform application of this principle, utilization of the new medical certification form is mandatory.

This form makes the physician responsible for indicating the train of events which resulted in death. The certifying medical practitioner is the only one in a position to decide which of the conditions led directly to death, and to state the antecedent conditions, if any.

In Part I of the section (Item 19-I) reproduced here is reported the cause leading directly to death (line IA), and also the antecedent conditions (lines IB and IC) which give rise to the cause reported in line IA—the underlying cause being stated last in the sequence of events. However, no entry is necessary in lines IB and IC if the disease or conditions leading directly to death, stated in line IA, describe completely the series of events.

In Part II (Item 19-II) is entered any other significant condition which unfavorably influenced the course of the morbid process, and thus contributed to the fatal outcome, but which was not related to the disease or condition directly causing death.

In summary, the manner in which the physician enters the cause of death will be the deciding factor in determining for statistical purposes the underlying cause—which of course is the essence of the data on the certificate. The new plan eliminates the old procedure of using an arbitrary manual to select the statistical cause of death when more than one condition is certified by the attending physician. Revised classification procedure and the modified form of the medical certificate of cause of death have both been adopted as uniform international aids to more accurate and more comparable death statistics.

CAUSE OF DEATH (Enter only one cause per line for (A), (B) and (C))	19-I. This does not mean the mode of dying such as heart failure, asthenia, etc. It means the disease, injury or complications which caused death.	19-IA Disease or Condition Directly Leading to Death	◄	APPROXIMATE INTERVAL BETWEEN ONSET AND DEATH
	ANTECEDENT CAUSES Morbid conditions, if any, giving rise to the above cause (A) stating the underlying cause last.	19-IB Due to	◄	
		19-IC Due to	◄	
	19-II. Conditions contributing to the death but not related to the disease or condition causing death.	19-II. Other Significant Conditions	◄	

(The above is not an exact reproduction; the form to be used is somewhat larger and more space is provided for the required notations.)

BOOK REVIEWS

TECHNIQUE OF TREATMENT FOR THE CEREBRAL PALSY CHILD. By Paula F. Egel, Cerebral Palsy Director, Children's Hospital, Buffalo, N. Y. 203 pages, 49 illustrations. The C. V. Mosby Company, St. Louis, Mo., 1948. $3.50.

The author of this little manual, while not a physician, is clearly a physical therapist of ability and wide experience in the field of cerebral palsy. The introductory chapters on the history and classification of spastic disorders are sketchy and in some respects not in harmony with the newer developments in the functional aspects of neuroanatomy; e.g., the assignment of the stretch reflexes to the frontal lobes is incorrect. Most of the volume, and the really valuable part, is coupled with descriptions in detail of the various exercises, apparatus and devices used in the treatment of spastic children, abundantly illustrated with excellent photographs. At the end, there are a six-page list of required apparatus and equipment, an appendix (by Moir P. Tanner) on the organization of a cerebral palsy department in a children's hospital, and an adequate index.

While the main usefulness of the book will be to physical therapists working under competent medical direction, it will also be of interest as a reference source to anyone dealing professionally with spastic children, or contemplating the organization of facilities for their care.

* * *

SEX VARIANTS, A STUDY OF HOMOSEXUAL PATTERNS. By George W. Henry, M.D. (With sections contributed by specialists in particular fields). Sponsored by Committee for the Study of Sex Variants, Inc. Paul B. Hoeber, Inc., one volume edition, 1948.

Homosexuality has presented a serious problem for many years. The community's attitude to the homosexual is usually a revengeful and punishing one, and this causes him more concern than any anxiety he may have over his sex variance. How much of the aversion the public has for him is an unconscious counter-reaction to its own latent homosexuality and how much is an inherent dislike for anything or anyone who is "different" in personality makeup and behavior is difficult to ascertain. It must be remembered that homosexual behavior of the kind that brings itself to the attention of the police is not characteristic of homosexual persons in general, any more than heterosexual behavior in a setting which leads to action by the police is characteristic of most people. It is the acts of the homosexual who may indulge in behavior offending "public decency," such as seducing the young, carrying out abnormal sexual practices for monetary gain, or soliciting, which arouse public wrath and which come to the attention of the public, and these can give a very distorted view of the general problem.

This volume is an encyclopedic work on the problem of sex variation in men and women. Formerly published in 1941 in two volumes, the present publication is in one, and consists of carefully collected data on the biographies of 80 sex variants. The facts are presented in an unprejudiced manner without preconceived concepts or theoretical speculation so that the reader may draw his own conclusions from the histories. These were obtained in as great detail as possible from the subjects who were, for the most part, members of professional groups. A "modified free association method" was used, and rechecked two years later. The cases were divided equally between men and women. Thorough physical examinations, including a pelvic examination of the women, were done, and x-ray examinations of the skull and pelvis made. A number of the men submitted specimens of semen for study and determination, and Terman-Miles psychological tests, devised to show differences between men and women, were administered. The histories are recorded in autobiographical form, and are followed by a comment by the author succinctly reviewing the more important aspects of the case. Records of bisexuals, homosexuals, and those with "narcissistic" psychosexual behavior are presented.

The author believes that the sex variant remains at an immature level of sexual adjustment because of constitutional deficiences, the influences of family patterns of sexual adjustment, or because of lack of opportunities for psychosexual development. Certainly, in general, structural anatomical or physiological deficiencies are difficult to demonstrate in most sex variants. For the sake of comparison, detailed hormonal studies must have been done, although, from what data there are at hand, there is little to indicate how the distribution of male and female hormones of the sex variant differs from the so-called normal. Family patterns of dominance and submission, and of masculinity and femininity, are of importance in that "a high proportion of masculinity in the females and of femininity in the males of a family is most likely to result in sex variants among the succeeding generations." Presumably Doctor Henry is here equating aggressive, dominant traits with masculinity, and dependent, submissive ones with femininity, masculinity in the female being manifested in aggressive occupations, aggressive attitudes to society, and intolerance of the situation requiring her to be a wife and mother, and femininity in the male being manifested in dependence on a more aggressive male or female, or through compensatory striving for the virility of a Don Juan. The author rightfully emphasizes that it is scientifically inaccurate to classify persons as fully male or female in regard to these traits.

As yet, society has no solution for the problems of the sex variant. He may on occasion be helped by psychotherapy. Punishment and incarceration in a penal institution certainly have proven of no value. Only further study and investigation will lead to fruitful clues as to the best methods of management in the future.

This volume is a storehouse of information which should prove useful to physicians, social workers, educators, lawyers, penologists, and probation officers who deal often with this complicated problem.

* * *

DETAILED ATLAS OF THE HEAD AND NECK. By Raymond C. Truex, M.S., Ph.D., Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University and Carl E. Kellner, Artist, Department of Anatomy, College of Physicians and Surgeons, Columbia University. Oxford University Press, New York, N. Y. 1948. $15.00.

Truex and Kellner's Detailed Atlas of the Head and Neck is an excellent book both in regard to portraying actual and detailed dissection and for the superb colored drawings. The Oxford University Press is complimented on its use of the best paper and materials in producing the careful dissections and illustrations.

The brain and the regional neuroanatomy show relationships with fascia, muscles, vessels, nerves and bones that is graphically revealing to the student and to the practitioner.

The orbit and its contents, the sinuses and paranasal sinus, mouth and larynx are illustrated in detail.

Frontal and transverse sections of the head and neck give detailed studies with the vessels and nerves in color.

This is an atlas valuable to the student interested in topographical relations, and also to the practitioner and those specializing in such fields as neural, dental and maxillofacial surgery, otolaryngology, and even ophthalmology and anesthesiology.

YOUR BABY—THE COMPLETE BABY BOOK FOR MOTHERS AND FATHERS. By Gladys Denny Shultz, Contributing Editor, Ladies' Home Journal and Lee Forrest Hill, M.D., Former President, American Academy of Pediatrics. Photography by Joseph Di Pietro, Line Drawings by Reisie Lonette, Doubleday & Company, Inc., Garden City, N. Y., 1948. $3.50.

Your Baby—The Complete Baby Book for Mothers and Fathers is a large and handsomely printed book on baby care. It contains numerous photographs and drawings particularly suited to a mother with her first child. It goes into great detail in a manner which will answer many of her questions and allay many of her fears. Without being dogmatic it reflects the latest changes in pediatric thinking in the matter of infant and child care.

Particular attention is paid to the period of pregnancy and preparation for the arrival of an infant. Particular attention is also paid to the father and there are numerous suggestions concerning his new role in the family. Its very personal "Dad and Mother" style may not appeal to all parents, however, particularly fathers.

It should prove a useful and popular addition to the numerous books available on the subject of Baby Care.

* * *

HALLMARKS OF MANKIND. By Frederic Wood Jones, D.Sc., M.B., B.S., F.R.S., F.R.C.S., Sir William Collins Professor of Human and Comparative Anatomy, Royal College of Surgeons of England. The Williams and Wilkins Co., Baltimore, Maryland, 1948. $2.50.

This book of 86 pages was developed from two lectures given in 1947 by the distinguished British anatomist, Frederic Wood Jones, who ably discusses the story of the ancestry of man as deducted from the newer knowledge of the anatomy of Primates and the newer paleontological discoveries.

The popularity of Darwin's "Descent of Man" and Huxley's "Man's Place in Nature" does not of necessity make them correct; as Jones shows, man is an extremely primitive type and has "his own remarkable structural specializations that distinguish him from all other mammals and appear to be his very ancient hallmarks."

One hopes that the findings and arguments of Jones will supplant those of Darwin and Huxley and thereby prevent such stupid events as the trial of a teacher in Tennessee about the doctrine of evolution.

This little volume will be read by those who realize that the existing Primates "are a complex assemblage and not a simple phylogenetic series," and who wish to learn more of the most important event to occur in the evolution of living things, namely, bodily erectness.

* * *

A.M.A. INTERNS' MANUAL. 209 pages. W. B. Saunders Company, Philadelphia, 1948. $2.25.

This Interns' Manual is a useful compendium for the intern and has sections on the internships and residencies, simple clinical and laboratory data, drug administrations and a short Materia Medica, a section on acute poisoning, and one on diet and nutrition, physical medicine, and the legal aspects of intern practice. The book will undoubtedly serve a useful function but it lacks the details of medical emergencies seen in the "Handbook of Medical Emergencies" by the Harvard University Press, and it does not provide the detail that is available in the complete publication, "The Physician's Handbook," by the University Medical Publishers of Palo Alto.

Nevertheless, the A.M.A. Interns' Manual contains some information not present in either of the other two books mentioned above.

The Manual can be recommended as a reliable guide to the physician beginning his internship.

MANUAL OF UROLOGY. By R. M. LeComte, M.D., F.A.C.S., formerly Professor of Urology, Georgetown University. Fourth Edition. The William and Wilkins Company, Baltimore, Maryland, 1948. $4.00.

LeComte's "Manual of Urology" is a suitable book for the general practitioner who sees an occasional urologic case. It is a good text for the medical student or for the part-time urologist to use as a reference work in reviewing the ordinary office procedures. The book is written simply, without complicated discussions, in most cases giving Le Comte's own views on various diseases. The treatment of urinary infection by the antibiotics and the new chemical drugs has been brought up to date. The illustrations are few but clear-cut, and an excellent bibliography on the various chapters is appended. The book is well printed, and is an excellent value for those who need, as LeComte calls his work, a manual of urology. LeComte makes no claim that the book is an all-inclusive text, and it would be of little value to the experienced urologist.

* * *

ABDOMINAL OPERATIONS. By Rodney Maingot, F.R.C.S. Eng., Surgeon to the Royal Free Hospital, London. Second Edition. 1298 pages, 1051 illustrations. Appleton-Century-Crofts, Inc., New York, 1948. $16.00.

The evolution of surgical technique is progressing at an extremely rapid pace. Operative procedures considered impossible become, in a few months, quite commonplace procedures. To write a textbook which is completely up to date becomes, therefore, an ever-increasingly difficult task. This, however, has been nobly accomplished in Maingot's book, "Abdominal Operations."

The author has in each chapter drawn up the latest references and descriptive illustrations of outstanding authorities, both European and American. Most of these are American but other authorities are not overlooked as is sometimes the custom of American writers. The various surgical techniques are exceptionally well illustrated and all discussions are clear and to the point.

In procedures where there are differences of opinion by many authorities, the writer has endeavored to give, fairly and concisely, the pros and cons of each procedure. Among these are noted such problems as in: abdominal perineal resection; abdominal colostomy versus pull-through; anterior versus posterior gastrojejunostomy in gastric resection; open versus closed intestinal anastomosis; the question of primary anastomosis in low rectosigmoid lesions, and many others.

It must be kept in mind that the book covers only abdominal surgery. Gynecological and urological abdominal procedures such as ureteral transplants are not included. The thoracic abdominal approach to lesions of the cardiac end of the stomach is, however, illustrated.

The book can be recommended as the most modern contribution among textbooks on abdominal surgery.

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HUMAN BIOCHEMISTRY. By Israel S. Kleiner, Ph.D., Professor of Biochemistry and Director of Department of Physiology and Biochemistry, New York Medical College. With 77 text illustrations and five color plates. Second Edition. The C. V. Mosby Company, St. Louis, Mo., 1948. $7.00.

This text contains an enormous amount of useful information in a very concise form. It is well organized and very broad in its scope. It should be very useful for the student or practitioner who wishes to get a bird's-eye view of chemical aberrations in any disease in its briefest form. The book does not contain detailed information on most medical chemistry, although some sections are quite extensive. There is no description of analytic methods, but much discussion of the interpretation of the results. The integration of the material is good, but suffers from some of the troubles which beset any non-medical writer who ventures into clinical interpretations. There are inaccuracies and some frank errors. Nevertheless, the book should be a very useful one as a quick reference source for students of medical chemistry.

* * *

THE CLINICAL APPRENTICE. A Guide for Students of Medicine by John M. Naish, M.D. (Cantab.), Lately Tutor in Medicine, Bristol University and John Apley, M.D. (Lond.), Honorary Pediatrician, Royal United Hospital, Bath. The William and Wilkins Co., Baltimore, Maryland, 1948. $4.50.

This is a small book written for English students beginning their clinical training in medicine. The authors have designed it to help the student who is working in physical diagnosis. At this stage of his career he has difficulty in correlating the tremendous amount of information which he has accumulated in his preclinical sciences, the detailed examination which he is told to follow and the apparently brief examination with which the experienced practitioner contents himself. The book makes no attempt to give a comprehensive account of the methods of examination and the difficulties associated with the mastery of physical diagnosis, but emphasizes certain essentials in order to make the techniques of physical examination stand out as vivid and understandable.

For a small book it has a great deal of useful information. While it is essentially concerned with physical diagnosis, it also represents a summary of the medical philosophy of the authors. It is practical and commonsensical in its approach. It has a number of well drawn and pointed diagrams. It may be helpful to American students as a reference to certain aspects of physical diagnosis but can not be considered in the light of replacing any of the more comprehensive books which are available at present.

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STERILITY AND IMPAIRED FERTILITY, Pathogenesis, Investigation and Treatment. By Cedric Lane-Roberts, C.V.O., M.S., F.R.C.S., F.R.C.O.G.; Albert Sharman, M.D., Ph.D., M.R.C.O.G.; Kenneth Walker, M.A., M.D., B.C. (Cantab.), F.R.C.S., F.I.C.S.; B. P. Wiesner, D.Sc., Ph.D., F.R.S.E.; and Mary Barton, M.B., B.S. Second Edition. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, N. Y., 1948. $6.50.

Cedric Lane-Roberts, Albert Sharman, gynecologists, and Kenneth Walker, urologist, collaborated with B. P. Wiesner, biologist, as authors of the first edition. Mary Barton, first assistant to the Fertility Clinic, Royal Free Hospital, London, has been added to the list of authors of the second edition. This volume is a general review of the problem of infertility in the human and deals with both the male and female factors. It is apparently the first work of this kind published in England and it is dignified by a masterly introduction from the pen of Lord Horder.

From our viewpoint there should have been a better revision for the second edition. There are many omissions of important recent advances in our knowledge but the subject matter covered is extensive and will prove of great value to the student and general practitioner who desire a groundwork for this study. To the great amount of compiled material the Lane-Roberts group also have added much from their own clinical and laboratory experience.

There is no other single volume that will give the reader the amount of information, much in detail, that is contained in this handy book. It is of worth as it presents a review, incomplete as it is, of valuable research and laboratory findings, which otherwise would entail a great amount of time and laborious search to obtain.

The first three chapters constitute an excellent introduction and general survey of the problem. Chapters III through VI deal with fertility and impaired fertility of the male. The chapters on The Constitution of Semen and Assay of Fertility will give the reader an excellent over-all view as well as considerable detail in these essentials. However, the authors' statement in the summary that "the assay must be based primarily upon the morphological characteristics of the spermatozoa and their capacity to invade ovulatory cervical mucus" will not be accepted by the majority of investigators, as the number of spermatozoa is undoubtedly a determining factor.

Many of the opinions expressed by the authors are not in accord with those of most investigators in the field. For instance, impaired fertility is often indicated in the semen only by a reduction in the number of spermatozoa, while their morphology remains normal. Yet the statement is made by the authors that in checking the results of treatment by repeated semen tests it is seldom necessary to do more than study the morphology of the spermatozoa.

Chapters VII and VIII are concerned with infertility in the female. The authors first deal with theoretical considerations, stages in investigation, disturbances of endocrine mechanism, and then with therapeutic procedures, including special measures, surgical methods and an adequate consideration of artificial insemination. However, the reviewer feels that some parts of the book were written by a good clinician who was somewhat led astray by the glittering findings of the laboratory. Some of the discussions relating to the endocrine factors, for instance, are tinctured with too many speculations based on animal experimentation and not proven as applicable to clinical work. This is especially seen in the sections which deal with the usage of tests for gonadotropic and estrogenic hormones in the blood and urine, procedures which in this country have remained within the sanctuary of research groups and have been shown generally impractical for the practicing physician. The same applies to some questionable recommendations regarding endocrine therapy.

This book can be accepted as a good general review and most of the recommendations for investigation and therapy are in keeping with the practices advocated by American authorities.

* * *

PATHOLOGY. Edited by W. A. D. Anderson, M.A., M.D., F.A.C.P., Professor of Pathology and Bacteriology, Marquette University School of Medicine, Milwaukee, Wisconsin. The C. V. Mosby Co., St. Louis, Mo. $15.00.

This book is different from other English language textbooks of pathology, in that it represents the work of 32 collaborators. This has resulted in an authoritative presentation of most of the important fields of pathology. The discussions on the whole are somewhat more detailed than those in other textbooks in English, and this has been accomplished without introducing detail to a confusing degree, yet the reader receives in most chapters a satisfactory idea of our incomplete understanding of the pathogenesis of many diseases.

Although a few recent contributions to pathology have not been included, this first edition is up-to-date. and several modern studies, such as the effects of radiation, are discussed in detail. The skin, the bones and the nervous system are given more comprehensive treatment than in most other textbooks.

The book is well illustrated, with ten plates in color. Most of the many photomicrographs are excellent. The lines of type are more closely placed than in most comparable textbooks, but the text is readable, and without this space-saving device, it would probably have been impossible to include all of the material in the one volume, which, as it is, has 1,426 pages.

This textbook should be useful for students, and it should be a valuable reference book for physicians.

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The Experimental and Clinical Use of Polymyxin, Chloromycetin, and Aureomycin

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SUMMARY

Polymyxin is an effective antibiotic for the treatment of severe infections produced by Ps. aeruginosa, H. pertussis, H. influenzae, E. coli, and A. aerogenes. Its toxicity to date precludes its general use in infections susceptible to its therapeutic effects.

Chloromycetin has been demonstrated to be an effective antibiotic agent for the treatment of rickettsial diseases and typhoid fever. It will undoubtedly prove effective in the treatment of other infections produced by certain Gram-negative micro-organisms and viral agents.

Aureomycin has been shown to be an active antibiotic agent against rickettsial diseases, primary atypical pneumonia, acute brucellosis, pneumococcal, streptococcal, and staphylococcal infections, urinary tract infections produced by E. coli, A. aerogenes and Strept. fecalis, certain types of infections of the eye, and in subacute bacterial endocarditis when the infecting agent is Strept. fecalis. Its clinical use in forms of extrapulmonary tuberculosis is in a completely experimental stage. It is not recommended in typhoid fever or in infections due to Ps. aeruginosa or P. vulgaris, and it seems to be ineffective in whooping cough.

To date, neither chloromycetin nor aureomycin has shown significant signs of systemic toxicity.

DURING the past 18 months, three new antibiotic agents, polymyxin,* chloromycetin,† and aureomycin,‡ have been described. The purpose of this presentation is to discuss certain observations which have been made regarding the antibacterial or bacteriostatic activity, the pharmacology and toxicity, the comparative effectiveness in experimental infections, and the potential clinical uses and value of these three compounds.

BACTERIAL AND BACTERIOSTATIC ACTIVITY

It can be said that, from the point of view of antibacterial activity, the polymyxins are definitely more effective *in vitro* than is streptomycin against certain Gram-negative bacteria. In our experience polymyxin D has from two to eighty times the activity of streptomycin against susceptible bacteria (see Table 1).

Furthermore, the activity of polymyxin is primarily bactericidal in the concentrations used, while that of streptomycin is bacteriostatic. Another point

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*References 1, 4-6, 9-11, 26, 36, 46-48.

†References 3, 21, 32, 33, 40-44, 50, 53.

‡References 2, 7, 8, 12-20, 23-25, 27-31, 34, 35, 37-39, 45, 49, 51, 52.

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From the Department of Preventive Medicine, The Johns Hopkins University School of Medicine. These investigations were supported by grants from the Abbott Laboratories; Eli Lilly and Company; Lederle Laboratories Division, American Cyanamid Company; Parke, Davis and Company; The Upjohn Company; and the Antibiotic Study Section, Division of Research Grants and Fellowships, The National Institutes of Health, Public Health Service of the Federal Security Agency. Polymyxin D and aureomycin were furnished by the Lederle Laboratory Division, American Cyanamid Company. Polymyxin B was supplied by Burroughs-Wellcome Company and chloromycetin by Parke, Davis and Company.

of interest is that the authors have been unable to produce resistant organisms by exposure to polymyxin over long periods of time. Chloromycetin and aureomycin exert bacteriostatic effects on certain Gram-positive and Gram-negative bacteria *in vitro.* In testing these effects, the comparison for Gram-positive organisms has been made with penicillin, while streptomycin has been used for comparison in the instance of the Gram-negative organisms. Aureomycin was found to be from four to sixteen times as active as was chloromycetin against streptococci, pneumococci, and staphylococci, and from ten to eighty times less effective than penicillin against these organisms except in the instance of streptococci belonging to Group D in Lancefield's classification. When Gram-negative organisms were tested, the bacteriostatic activity of aureomycin and chloromycetin were comparable, but generally less than the antibacterial activity of polymyxin (see Tables 2 and 3).

The exceptions to this statement are the relative effectiveness of chloromycetin again certain strains of P. vulgaris, and the almost total lack of activity of chloromycetin and aureomycin against strains of Ps. aeruginosa. Aureomycin has also been tested against 11 strains of organisms belonging to the Brucella group and has been an effective bacteriostatic agent after 72 hours in concentrations of 0.25 to 2.0 micrograms per ml. or less. Other investigators have reported that polymyxin[9, 46] has an antibacterial effect against A. aerogenes, S. typhosa, E. coli, K. pneumoniae, P. multocida, S. gallinarum, S. pullorum, and S. flexner; that chloromycetin[44] has a bacteriostatic action against S. schottmulleri, Shig. paradysenteriae (Sonne), B. mycoides, Borrelia recurrentis, Br. abortus, Br. suis, Br. melitensis, S. typhosa, H. pertussis, P. tularense, selected strains of Mycobacterium tuberculosis, V. hominis, and certain yeasts and filamentous fungi; and that aureomycin[24, 30,31] has a similar effect against various strains of Salmonella, N. catarrhalis, N. gon-

TABLE 1.—*Comparison of Streptomycin, Polymyxin D, Penicillin G in Vitro*

GRAM-NEGATIVE BACILLI

		Minimal Inhibitory Concentration (Gamma/cc.)	
Organism		Streptomycin	Poly. D
E. coli	No. 4	6.25	.16
	No. 9	6.25	.16
E. communior	No. 14	2.5	.62
Citrobacter	No. 6	5.0	.62
Aerobacter	No. 10	>100	1.25
	No. 12	2.5	1.25
Friedlander	A	.62	.31
	B	5.0	.62
Pyocyaneus	Her.	25	1.25
	Cal.	100	2.5
	But.	100	2.5
	No. 16	50	2.5
Proteus	No. 11	5	>100
	No. 17	5	>100
	No. 18	5	>100
	Her.	12.5	>100

GRAM-POSITIVE COCCI

		Minimal Inhibitory Concentration (Gamma/cc.)	
Organism		Streptomycin	Peni. G
Streptococcus:			
Beta Gr. A	C203	12.5	.008
D	Zymo	50	2.5
	22 A	50	2.5
Alpha fecalis	Bla.	50	2.5
	Twy	10	2.5
Pneumococcus I	SVI	12.5	.016
	Baily	2	.012
Staphylococci:			
Aureus	Zeut.	12.5	.062
	Zorn.	2	.062
Albus	Heatly	2	.016

TABLE 2.—*Comparison of Chloromycetin, Aureomycin, Polymyxin D in Vitro*

GRAM-NEGATIVE BACILLI

		Minimal Inhibitory Concentration (Gamma/cc.)		
Organism		Chloro.	Aureo.	Poly D.
E. coli	No. 4	5	5	.165
	No. 9	10	5	.156
E. communior	No. 14	5	5	.625
Citrobacter	No. 6	5	5	.625
Aerobacter	No. 10	5	5	1.25
	No. 12	5	2.5	1.25
Friedlander	A	1.25	1.25	.312
	B	5	5	.625
Pyocyaneus	Her.	>100	100	1.25
	Cal.	100	100	2.5
	No. 16	>100	100	.625
	But.	100	100	2.5
Proteus	No. 11	<3.1	.625	>100
	No. 17	12.5	50	>100
	No. 18	25	100	>100
	Her.	12.5	100	....

TABLE 3.—*Comparison of Chloromycetin, Aureomycin, Penicillin G in Vitro*

GRAM-POSITIVE COCCI

		Minimal Inhibitory Concentration (Gamma/cc.)		
Organism		Chloro.	Aureo.	Peni. G
Streptococci:				
Beta Group A	C203	5	.312	.008
B	090	5	1.25	.016
B	19	5	.625	.035
C	K61	5	.625	.016
D	Zymo.	10	1.25	2.5
D	22A	10	.625	2.5
F	For.	2.5	.625	.05
F	H59	5	1.25	.016
Alpha fecalis	Bla.	10	1.25	2.5
	Tar.	10	1.25	2.5
	West.	10	1.25	2.5
Viridans	Dop.	5	.625	.625
	Keel.	10	.625	2.5
Pneumococcus I	SVI	2.5	.312	.016
Staphylococci:				
Aureus	Zeut.	5	.625	.062
	Zorn.	5	.625	.062
	Gelb.	5	.625	.062
	Gibb.	10	.625	.012
Albus	Heatly	5	.625	.012

orrheae, N. meningitidis, pleuropneumonia-like organisms, S. typhosa, H. hemolyticus, and certain other micro-organisms. Paine and co-workers[31] have reported that they have been able to produce resistance to aureomycin in certain strains of A. aerogenes and Kl. pneumoniae by repetitive cultivation in media containing the antibiotic, and the authors of this presentation have occasionally been able to produce a fourfold increase in the resistance to aureomycin of a strain of micro-organisms. However, such experiences are infrequent and of a low order, which makes the interpretation of their real meaning difficult. The conclusion has to be that it is difficult to produce resistance *in vitro* to aureomycin.

EXPERIMENTAL TOXICITY

Polymyxin D is moderately toxic for white mice, the LD_{50} being 250 to 300 mg. per kg. of body weight when the antibiotic is given by a single subcutaneous injection. Because of its relative insolubility, it is difficult to determine the LD_{50} of chloromycetin for mice. However, it has been reported that the LD_{50} of this compound in propylene glycol is 245 mg. per kg. when it is administered to white mice by the intravenous route. For aureomycin, the LD_{50} for white mice was found to be 3,500 mg. per kg. when this antibiotic was given by the subcutaneous route. In larger animals, such as dogs, 10 mg. of polymyxin D per kg. injected twice a day by the intramuscular route for seven days was well tolerated. With chloromycetin, dogs receiving from 72 to 80 mg. per kg. per day by the intramuscular route for 38 doses (five days a wek) developed varying degrees of anemia during the period of the test, while dogs receiving 40 mg. per kg. per day of aureomycin for nine days by the intramuscular route showed signs of anorexia and loss of weight. Because the hydrochloride of aureomycin, which is quite acid, was used in these tests, varying degrees of local necrosis were noted in these experimental animals. Neither polymyxin, nor aureomycin, nor chloromycetin produced any significant changes in the leukocyte counts, blood sugar, or liver function tests in the experimental animals. All samples of polymyxin tested to date have produced albumin, casts, leukocytes and erythrocytes in the urine of rats which had received polymyxin intravenously in daily dosage of 20 mg. per kg. Histological examinations of the kidneys of such rats show definite evidence of lower nephron damage. Certain specimens of polymyxin have produced symptoms and signs of histamine shock when injected into rats by the intramuscular route. It is possible that these reactions resulted from impurities in the material under test.

PHARMACOLOGY

Polymyxin D passes readily into the blood stream following its intramuscular injection into dogs. Ninety minutes after dogs had received single intramuscular doses of 5 or 10 mg. per kg., concentrations of 2.5 and 5.0 micrograms of polymyxin per ml. were recorded. Detectable amounts of the antibiotic were still present in the serum at three and one-half hours. When dogs were given 5 or 10 mg. of the compound per kg. twice daily for seven days, concentrations of from 10 to 20 mg. of polymyxin per ml. of serum were noted. No polymyxin was detected in the spinal fluid of dogs in which high concentrations of polymyxin were present in the serum. When polymyxin was administered to human beings in divided doses by the intramuscular route at intervals of three hours in amounts not to exceed a total daily dose of 3 mg. per kg. of body weight, concentrations of 0.6 to 1.3 micrograms of the antibiotic per ml. were noted in the sera after 24 hours of therapy. Detectable amounts of the antibiotic were present in the urine of these patients. To date it has not been found in the spinal fluid of patients suffering from purulent meningitis and treated with this antibiotic.

Aureomycin deteriorates quite rapidly when placed in solution. It is also bound by the proteins of blood serum in varying degrees. Hence, when biological testing against a strain of susceptible micro-organism is used for determining concentrations of this antibiotic in body fluids, the method is fraught with error. The same is also true when bacteriostatic tests are done. The figures obtained do not represent true values but rather qualitative instead of quantitative results. With this in mind, the following data are presented: When dogs and rabbits were injected with single doses of 20 or 40 mg. of aureomycin by the intramuscular route, concentrations of slightly over 1 microgram of the antibiotic per ml. were noted in the serum within one hour but not after that time. In a dog receiving 20 mg. of aureomycin per kg. of body weight twice a day for ten days, the antibiotic could be detected in the serum up until two and one-half hours after each injection. While the antibiotic was not observed in the spinal fluid, it did appear in quantity in the urine. When aureomycin was administered orally to human beings in doses of 500 mg. twice a day and 40 mg. every six hours by injection, concentrations of from 0.6 to 2.4 micrograms of the antibiotic per ml. were observed in the sera one hour after the injection was given. The antibiotic produces a greenish yellow discoloration of the urine, in which concentrations of from 40 to 360 micrograms per ml. have been observed.

Chloromycetin[44] appears promptly in the blood after the administration of a single oral dose or an intramuscular injection of this antibiotic. It also would appear that it is excreted fairly rapidly in the urine in which its recovery (as measured by biological tests) is fairly high. In experiments in which chloromycetin was administered to dogs over a period of 24 days by the oral or intramuscular route, concentrations of from 1 to 29 micrograms of chloromycetin per ml. of serum were noted two hours after treatment, and concentrations of 1 to 2 micrograms per ml. of serum, 18 hours after treatment. Concentrations of from 36 to 406 micrograms per ml. of urine were noted in these dogs. It was also determined that chloromycetin was bound to the proteins of the serum to the extent of about 45 per cent. In patients ill with typhoid fever,[50] and treated with initial daily doses of between 4 and 5 gm. of chloromycetin, concentrations of from 40 to 80 micrograms per ml. were noted in the serum within the first 24 hours of treatment. It was also observed that the concentration of chloromycetin in the spinal fluid was approximately half that noted in the blood.

TREATMENT OF EXPERIMENTAL INFECTIONS

Polymyxin has been shown to be an effective chemotherapeutic agent in the treatment of experimental infections in mice produced by K. pneumoniae, Type A (Friedlander's bacillus),[5, 11, 46] H. influenzae,[6] P. multocida,[46] and Shigella gallinarum.[46] In our laboratory it appeared to be from five to ten times more effective in the control of infections produced in mice by K. pneumoniae and H. influenzae than is streptomycin.

Chloromycetin has been shown to have a chemotherapeutic effect in experimental infections produced by rickettsia,[14, 21] K. pneumoniae, Type A,[44] Shigella paradysenteriae Sonne,[44] D. pneumoniae,[44] Strept. hemolyticus and Strept. viridans,[44] and certain viruses of the psittacosis group.[44] Wong and Cox[49] demonstrated that aureomycin is an effective chemotherapeutic agent in the treatment of experimental infections produced by various types of rickettsia. SubbaRow and his co-workers[24] have shown that this antibiotic cured experimental infections in mice produced by hemolytic streptococci, pneumococci, or K. pneumoniae, Type A. Heilman[25] has reported that aureomycin was effective against experimental infections produced by Borrelia novyi or Leptospira icterohemorrhagiae (see Tables 4, 5 and 6).

In tests made in our own laboratory of the comparative therapeutic effects of chloromycetin, aureomycin, polymyxin D, and penicillin in certain experimental infections in mice, the following results were obtained: As will be noted from a perusal of Table 4, in experimental infections in mice produced by the injection intraperitoneally of 10,000 M.L.D. of K. pneumoniae, Type A, aureomycin and chloromycetin showed essentially equal therapeutic activity. Both were about a hundred times less effective at the dosage levels employed than was polymyxin. As is shown in Table 5, in the treatment of experimental infections in mice produced by the intraperitoneal injection of 10,000 M.L.D. of Strept. hemolyticus (strain C203), aureomycin appeared to be about 25 times more effective than chloromycetin, and about ten times less effective than was crystalline penicillin G. When mice were infected with 10,000 M.L.D. of D. pneumoniae, Type I (strain SVI), and then treated (Table 6), aureomycin was over 40 times more effective as a therapeutic agent than was chloromycetin, and about five times less effective than was crystalline penicillin G. In these tests only an approximate comparison could be made between aureomycin and chloromycetin because of the relative insolubility of the latter compound. In making these studies of therapeutic effectiveness, the mice were treated by the subcutaneous route, immediately, at five hours, and then at 23 hours after they had been infected. They were observed for six days after therapy had been discontinued.

TREATMENT OF INFECTIONS IN HUMAN BEINGS

There can be no doubt as to the therapeutic effectiveness of polymyxin for the treatment of local and systemic infections produced in human beings by certain Gram-negative bacilli. Outstanding among the infections which have responded to treatment with this antibiotic have been those due to Ps. aeruginosa, K. pneumoniae, H. pertussis, H. influenzae, Type B, and E. coli. In severe instances of infection which were treated by the intramuscular injection of

TABLE 4.—*Comparison of the Effects of Aureomycin, Chloromycetin and Polymyxin D in Friedlander Infection in Mice*

Friedlander A—10,000 M.L.D. Injected I.P.—10 Mice Each Group

Dose	Per Cent Survival			
Gamma/Gram	Aureo.	Chloro.	Poly. D	Controls
80	80	90	....	....
25	10	10	....	....
8	0	0	....	....
4	....	....	80	....
1.25	....	....	90	....
0.4	....	....	50	....
0	....	....	....	0

(Drug Administered S.C., Stat., 5 and 23 Hours After Infection)

TABLE 5.—*Comparison of the Effects of Aureomycin, Chloromycetin and Penicillin G in Hemolytic Streptococcal Infection in Mice*

C203 Strain—10,000 M.L.D. Injected I.P.—10 Mice Each Group

Dose	Per Cent Survival			
Gamma/Gram	Aureo.	Chloro.	Peni.G	Controls
50	....	30	....	....
10	....	0	....	....
2	50	0	....	....
1	0	....	....	....
0.5	0	....	....	....
0.2	....	....	40	....
0.1	....	....	0	....
0.05	....	....	0	....
0	....	....	....	0

(Drug Administered S.C., Stat., 5½ and 23 Hours After Infection)

TABLE 6.—*A Comparison of the Effects of Aureomycin, Chloromycetin and Penicillin G in Experimental Pneumococcal Infections (SVI Type I Pneumococcus)*

10,000 M.L.D. Inocula. I.P.—10 Mice Each Group

Dose	Per Cent Survival			
Gamma/Gram	Aureo.	Chloro.	Peni.G	Controls
20	90	0	....	....
8	30	0	....	....
5	....	....	80	....
2	10	0	60	....
0.8	....	....	10	....
0	....	....	....	0

(Drug Administered S.C., Stat., 5 and 23 Hours After Infection) polymyxin at three-hour intervals, the results frequently have been very satisfactory. As an example, the course of a patient deathly ill as a result of a systemic infection produced by Ps. aeruginosa will be outlined. This man had been treated with sulfadiazine, penicillin, and streptomycin without beneficial results. At the time therapy with polymyxin D was initiated, the patient was deeply jaundiced, there was consolidation of the left lung, a bacteriological culture of the blood was positive, and, in the opinion of several competent clinicians, he was moribund. The effect of treatment with polymyxin was more than dramatic, as the patient was well on the road to recovery within 24 hours after therapy was started.

The total daily dose of polymyxin D has been based upon 3 to 6 mg. of the antibiotic per kg. of body weight, this being split into six equal doses and given in a special buffer solution (pH 7.4) at intervals of four hours. It is indeed unfortunate that the toxicity (as will be described later) of the various specimens of polymyxin which have been tested to date is such as to preclude the general use of this antibiotic. However, it must be said that in severe instances of systemic or localized infections due to Ps. aeruginosa, K. pneumoniae, A. aerogenes, H. pertussis, etc., the authors would not hesitate to employ polymyxin D as a therapeutic agent in cases in which the dangers of the disease outweighed those of temporary renal damage. This antibiotic may be life-saving.

Chloromycetin has been shown to be a highly effective therapeutic agent in the treatment of epidemic typhus,[32] scrub typhus,[43] Rocky Mountain spotted fever, eastern variety,[33] and typhoid fever.[50] Payne and his associates[32] have reported that chloromycetin in doses of 10 mg. per kg. of body weight per day given by the intravenous route, or 15 mg. per kg. of body weight per day given by the oral route for a period of three days, was effective in the treatment of epidemic typhus fever. Smadel and coworkers[43] have described the treatment of scrub typhus with this antibiotic. In 25 patients with this disease, the administration of chloromycetin in varying doses brought about a prompt cure. Doses as small as 6.0 gm. of chloromycetin given for *one day* produced satisfactory responses. Pincoffs and his co-workers[13] have tested the effects of chloromycetin in 15 patients ill with Rocky Mountain spotted fever, eastern variety. Here again, excellent results were obtained in all patients who were treated. Finally, Woodward, Smadel, Ley, Green, and Manikas[50] have found that chloromycetin administered by mouth in initial doses of 50 mg. per kg. and continuing doses of 0.25 gm. every two hours until the temperature was normal, and then in the same dose every three or four hours for the ensuing five days, exerted a specific therapeutic effect in ten patients ill with early typhoid fever, all of whom had at least one blood culture positive for S. typhosa before treatment was started. The average time in which the temperature returned to normal in these ten patients was three and one-half days. As chloromycetin has been in short supply, the authors have had little clinical experience with this antibiotic. It would appear very clear, however, that it is an extremely effective antibiotic for the treatment of rickettsial diseases, its use in typhoid fever seems established, and from experimental observations *in vitro* and *in vivo* it is likely that it will prove to be an effective chemotherapeutic agent in infections produced by certain Gram-negative organisms and viral agents.

It has been reported[33, 36] that aureomycin appeared to be an effective chemotherapeutic agent in the treatment of Rocky Mountain spotted fever, eastern variety, certain urinary tract infections produced by E. coli, A. aerogenes, or Strept. fecalis, acute and subacute undulant fever, primary atypical pneumonia, and staphylococcal infections. Recently Braley and Sanders[7, 8] have stated that this antibiotic is valuable in the treatment of staphylococcal conjunctivitis and blepharitis, influenzal conjunctivitis, pneumococcal conjunctivitis, inclusion conjunctivitis, early epidemic keratoconjunctivitis, dendritic keratitis, vernal conjunctivitis, and Mooren's ulcer. The agent was without effect in Piranaud's conjunctivitis and in late cases of epidemic keratoconjunctivitis. Wright and his co-workers[51, 52] believe that aureomycin "is the treatment of choice in all cases of lymphogranuloma infection." They also recommend further study of the effect of the drug in granuloma inguinale because of three favorable results which were obtained with it in patients ill with this disease. The results relative to granuloma inguinale have been confirmed by Greenblatt and co-workers[23] who reported excellent results when this antibiotic was used in three cases in which the disease had proven resistant to treatment with streptomycin.

Finland and his associates[16, 22] have reported that aureomycin exerted a beneficial effect in certain coccal infections, although in gonococcal infections the results were inferior to those which could be expected with penicillin. In Salmonella infections, the results were equivocal, while in urinary tract infections the effects of therapy were good, except in patients whose infections were produced by P. vulgaris or Ps. aeruginosa. Spink and co-workers[45] have used aureomycin in patients ill with acute and chronic brucellosis produced by infection with Br. melitensis. They state that "the immediate therapeutic results have surpassed those obtained with any therapy, including a combination of streptomycin and sulfadiazine." Lennette, Meiklejohn, and Thelen[27] tested the effects of aureomycin given by mouth in the treatment of Q fever. Prompt response to therapy was noted in 14 patients acutely ill with this disease. In one patient, in whom the disease was present in a chronic form, the antibiotic seemed to be ineffective. O'Leary, Kierland, and Herrell[29] have reported that "aureomycin appears to have some antispirochetal activity when administered by the oral route." This observation upon the effects was noted when the antibiotic was used in the treatment of two patients who had early syphilis.

To these observations may be added a report on further clinical experiences with aureomycin at Johns Hopkins Hospital. Sixteen patients ill with Rocky Mountain spotted fever, eastern variety, with the disease proven by serological methods in 13 of them, were treated with aureomycin. The details of this clinical experience have been recently described by Ross and co-workers.[35] The results obtained were excellent in all instances. Treatment with aureomycin was begun an average of 4.5 days after onset of symptoms. The temperature returned to normal in an average of 2.3 days after treatment was started. There were no complications. The average period of hospital stay was eight days. Experience with one patient is charted in Chart 1. One patient who was severely ill with Brill's disease was treated with prompt and excellent results, as was also one patient suffering from acute Q fever.

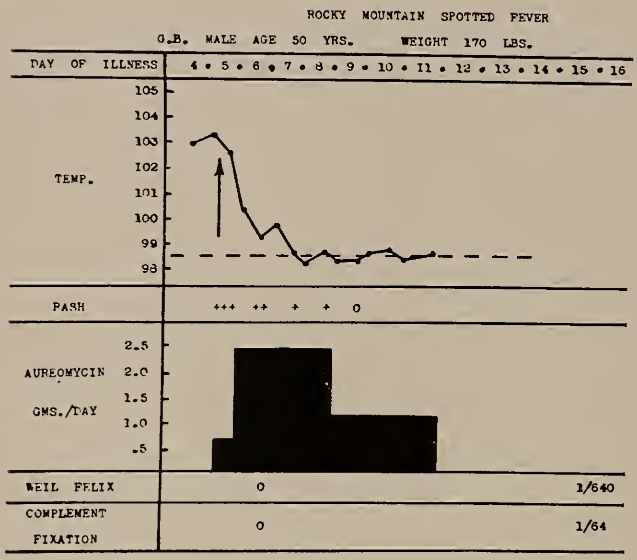

Chart 1

In 17 cases in which, by all available methods of exclusion, a diagnosis of primary atypical pneumonia was made, the patients were treated with aureomycin with excellent results. In 13 cases the temperature of the patient was normal in 24 hours, and in three within 48 hours. In one case in which four lobes were involved in the disease process, the patient was afebrile in 72 hours. All patients experienced prompt symptomatic relief and the pneumonic processes in the lungs cleared up rapidly after treatment was initiated. The details of this clinical experience are being reported by Schoenbach and Bryer.[39] Experience in one case is summarized in Chart 2.

Five patients ill with acute or subacute brucellosis, in all of whom positive blood cultures were obtained, were treated with aureomycin. In four of these patients the infection was due to Br. suis, while in the other Br. abortus was recovered from the blood. All had symptoms typical of the disease and four had enlarged spleens. The titer of antibody

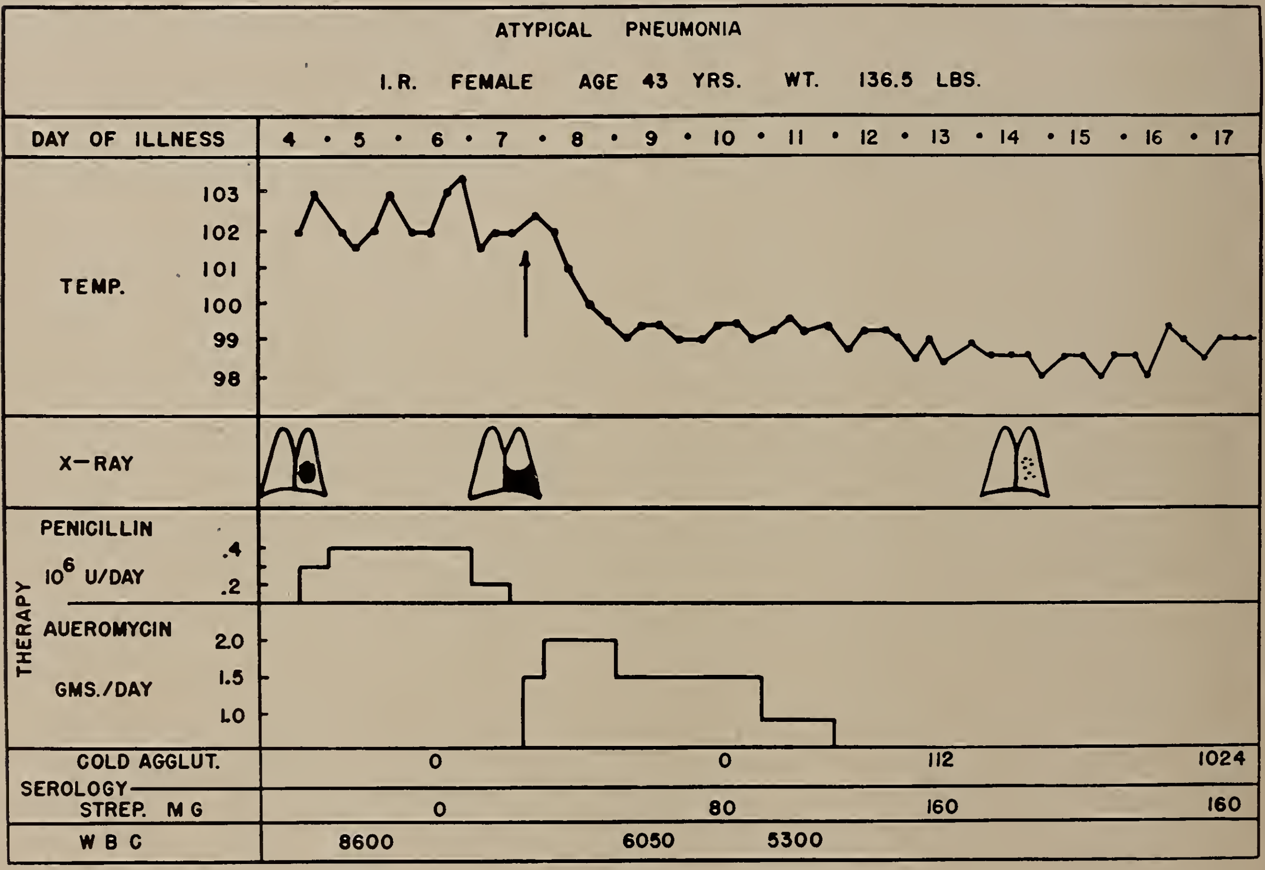

Chart 2

for the specific strain of the Brucella group with which they were infected was high in the serum of each patient. One had not been cured by previous treatment with sulfadiazine, streptomycin and sulfadiazine, and polymyxin, while another had had an ineffectual course of streptomycin and sulfadiazine. In all five patients there was dramatic clinical response to the administration of aureomycin, with the temperature falling to normal within 72 hours and with a progressive remission of all symptoms and signs. Treatment was carried out over a 14-day period. These patients have been followed from three to seven months. All have gained weight consistently and none has shown symptoms or signs of a return of the disease. The details of this experience are being reported by Bryer and his associates.[13] Experience in one case is shown in Chart 3.

Six patients with various forms of tuberculosis were treated with aureomycin. In three, who had tuberculous meningitis, the antibiotic was not effective. In the case of a 12-year-old Negro girl who had had five scrofulous sinuses in the neck for seven years, from each of which tubercle bacilli had been repeatedly isolated in guinea pigs, the administration of aureomycin for six weeks resulted in the closure of all sinuses a week after treatment had been started and, to date, there has been no recurrence of the disease. The fifth patient had advanced tuberculosis of the renal tract with marked involvement of the bladder. One kidney had been removed because of the infection. This patient has been under treatment for three months and has had a remission of the symptoms and signs of the disease. Treatment is being continued, however. A sixth patient ill with cavitating tuberculosis was treated for two weeks with aureomycin without evidence of clinical improvement. At the time of this writing it must be made very clear that no claims are being made for the therapeutic use of aureomycin in tuberculosis. This is merely a report of observations.

Five patients with typhoid fever were treated with aureomycin. While all recovered and in all cases blood and stool cultures became negative soon after antibiotic therapy had been instituted, the results as far as the decline in the fever and the general improvement of the patient were concerned were equivocal and might well have been due to chance. Chloromycetin would appear to be definitely superior to aureomycin for the treatment of this disease.

Eighteen patients with serious and complicated infections of the urinary tract were treated with aureomycin. All had previously received sulfonamides, penicillin or streptomycin, or a combination of them. All had anatomical or functional abnormalities of the urinary tract. The infecting organisms were E. coli, A. aerogenes, or Strept. fecalis or a mixture of two or more of these micro-organisms. The immediate effects from therapy were satisfactory in 17 and fair in one of these patients. It remains to be seen what the long time results

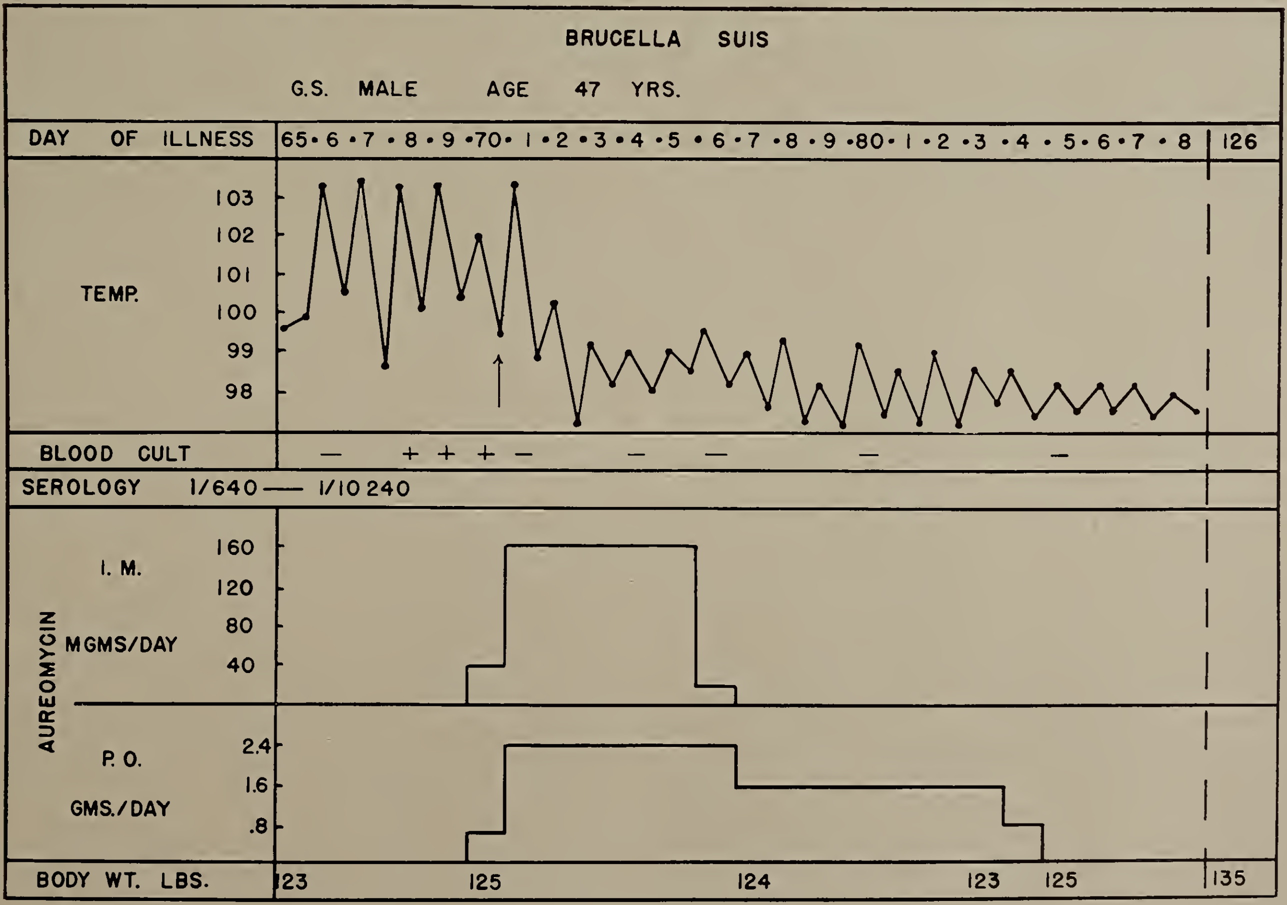

Chart 3

will be. Aureomycin is ineffective in urinary tract infection with Ps. aeruginosa or P. vulgaris.

Eight patients ill with moderate to severe infection with Staph. aureus hemolyticus, in two of whom staphylococcal bacteremia was present, were treated with aureomycin. In several of these patients antecedent therapy with sulfadiazine and/or penicillin had been unsuccessful. In seven of the eight patients prompt and satisfactory response to therapy was noted. In the eighth, an infant whose initial infection was staphylococcal pyodermia, extensive signs of pulmonary involvement were present despite continuous therapy with penicillin for a period of more than two months. When treatment with aureomycin was initiated, the pulmonary signs cleared rapidly except for one small area. After two weeks of therapy with aureomycin, material for culture was obtained from this area by bronchoscopic examination, and a strain of Staph. aureus hemolyticus, which was resistant *in vitro* to more than 100 micrograms of aureomycin per ml., was isolated. This patient now is clinically well. These experiences are being reported by Chandler, Schoenbach, and Bryer.[15]

Whenever a new antibiotic is being tested clinically, a number of patients with infections for which there is no experimental evidence for the use of the antibiotic must be treated with it, if only to maintain harmony in the society of physicians. Certain of these patients which we will place in the category of "miscellaneous infections" will be discussed. Among the patients with miscellaneous infections which experimental evidence indicated might be abated by use of aureomycin, were the following: One patient ill with meningitis produced by Strept. fecalis, was promptly cured by the oral administration of aureomycin. One patient ill with pneumococcal meningitis produced by D. pneumoniae, Type 6, had been treated with sulfadiazine and penicillin, and the infecting organism had become resistant to these therapeutic agents. Cultures of the spinal fluid were abundantly positive for D. pneumoniae before therapy with aureomycin was initiated. Recovery was prompt after this antibiotic had been administered. One patient, a child who had subacute bacterial endocarditis, with four cultures positive for Strept. fecalis, was treated with aureomycin by mouth for a period of two weeks with excellent results. Four months later this child seemed to be in good health. Another patient with the same disease, with blood cultures repeatedly positive for Strept. fecalis, was treated with excellent initial results insofar as abatement of fever and other signs and symptoms are concerned. However, the follow-up period is not yet long enough for the patient to be considered cured. Two patients who had brain abscesses, one due to Staph. aureus hemolyticus and the other to E. coli, have been treated with satisfactory results. Two patients ill with generalized peritonitis, with the infection in one case produced by E. coli and Strept. fecalis, and by Strept. fecalis in the other, have been successfully treated with aureomycin. In both instances the response to therapy was dramatic, and in both aureomycin was used after surgical therapy had not brought about the desired results. Aureomycin was given to two patients having definite signs of localized postoperative infections. In one the infection followed resection of a carcinoma of the colon with an end-to-end anastomosis of the bowel which broke down and resulted in a fecal sinus; in the other there was a persistent purulent abdominal sinus following drainage of a pelvic abscess. In both there was prompt remission of signs and symptoms together with a closure of the sinuses following therapy with aureomycin. In both instances the infecting organisms were E. coli and Strept. fecalis. Two patients ill with whooping cough did not respond to treatment with aureomycin. One patient each with polioencephalitis, noma, and pancreatic necrosis with secondary infection have been treated without results. The same is true of four patients ill with erythema multiforme.

ADMINISTRATION AND DOSAGE

Up to the present, oral administration is the method of choice for aureomycin. No satisfactory preparation for general intravenous use has been developed so far. The antibiotic, as supplied, is a hydrochloride salt, and when this is administered intramuscularly it produces pain due to the acidity of the product. This has militated against its use by this route. It is too early in the history of aureomycin to establish accurate dosage schedules for the administration of this antibiotic. It is likely that the dosage schedules recommended herein will eventually be proven to have been excessive. However, they have been effective. In severely ill patients who are being treated orally, the total daily dose of aureomycin should be based on 60 mg. per kg. of body weight. Initial "priming" doses equivalent to one-sixth of the total daily dose should be given to seriously ill patients at hourly intervals for three doses. Then one-sixth of the estimated daily dose should be given at intervals of four hours until the temperature has been normal for 24 hours. At this time the basis for the total daily dose should be reduced by one-half or to 30 mg. per kg. of body weight. This should be divided into four parts and given at intervals of six hours until the infection is eliminated. In moderately severe infections the total daily dose should be based on 30 mg. per kg. of body weight, this to be divided into four or six equal parts and given at intervals of six to four hours until the infection is under control. As approved derivatives of aureomycin for parenteral injection are not available, use of the drug by this route will not be discussed.

CLINICAL TOXICITY

Polymyxin, being a polypeptide or a mixture of polypeptides, should not produce toxic reactions as the result of the sensitization of the patient to the antibiotic. This has been true in the author's experience thus far. All specimens of this antibiotic which we have tested have produced varying degrees of renal tubular dysfunction. In the mildest form it appears as a fixation of the specific gravity of the urine, while in severe forms, oliguria with albumin, casts, erythrocytes and leukocytes in the urine, and elevated non-protein-nitrogen levels and depressed renal function may occur. These latter reactions sometimes become very disturbing and it is because of them that the general use of polymyxin seems contraindicated. Histamine-like reactions, hypasthesias, and fever have been noted in the course of polymyxin therapy, but these reactions would appear to be due to impurities in the specimens of polymyxin which were being used rather than to the antibiotic itself.

Neither aureomycin nor chloromycetin has shown significant evidence of clinical toxicity up to the present. This is extremely interesting, because, despite the fact that both of these products are derived from members of the family of Streptomyces, reports of sensitization or other toxic reactions have not been made, and this in face of the fact that several hundred patients have been treated with these antibiotics. Some nausea has been reported by patients receiving aureomycin, but this generally can be controlled by the administration of preparations containing aluminum hydroxide. The passage of two or three bulky stools per day is frequently reported by patients who are taking aureomycin. This change in the stool is apparently due to an alteration in, or wiping out of, the normal bacterial flow of the large bowel. As this may interfere with the synthesis of essential food elements, it may be advisable to administer supplementary vitamins to patients who are receiving aureomycin for periods longer than a week.

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Human Psittacosis Cured by Penicillin Therapy

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SUMMARY

A number of recent reports in the literature have told of cure of psittacosis in man following enormous doses of penicillin in the early stages of the disease. In most of these cases, however, the infection was experimentally induced in laboratory studies. Given late and in inadequate amounts, penicillin apparently has no beneficial effect.

With a means of treatment at hand, and effective if started early, careful analysis of all cases of "atypical pneumonia" is indicated with a view to determining if the infecting agent might not be the psittacosis virus. A history of contact with birds or bird droppings should be sought in all cases of "atypical pneumonia."

A case is reported in which the patient, because of contact with birds, was suspected early of having psittacosis. No benefit was noted following therapy with 100,000 units of penicillin every three hours for one day, but rapid recovery ensued when the dose was doubled.

THE high incidence in recent years of so-called "atypical pneumonias" with the implied inability to demonstrate or apply specific therapy for the causative agent in most cases, is accompanied by several unfortunate tendencies. There is the temptation incorrectly to consider all such cases of atypical pneumonia as belonging to a single disease entity; there is not enough concern at failure to demonstrate a causative agent in any given case; the lack of applicable specific therapy is too readily presumed. One must be on guard to avoid confusing with "primary atypical pneumonia of unknown cause" not only the unusual varieties of bacterial pneumonias but also the non-bacterial pneumonias in which the infecting agent is known, for included in these latter two groups are pneumonias in which specific therapy is possible. Psittacotic, or ornithotic pneumonia now appears to be one of these.

The ubiquity of the infective agent of psittacosis, one of the largest of the known viruses, has been established. Human infections have been traced not only to the psittacine birds, parrots and parakeets, but also to canaries, finches, petrels, chickens and pigeons. As stressed by Meyer,[6] who for this reason favors the term ornithosis over the narrower psittacosis, the bird reservoir of infection is large and diffuse; and Smadel[9] has observed that the incidence of psittacosis in humans having "atypical pneumonia" is greater than is generally recognized.

The diagnosis of psittacosis is seldom made early in the course of the disease because it depends for its confirmation upon procedures carried out in very few laboratories—the isolation of the virus from the sputum or blood of the patient through the inoculation of mice or other suitable animals, or the demonstration of a rising titre in the patient's blood of complement-fixing antibodies for psittacosis antigen. Early diagnosis is therefore presumptive. In all cases of "atypical pneumonia," a history of contact with birds or bird droppings should be sought; onset with severe headache, fever, toxicity, gastro-intestinal symptoms and non-productive cough, the presence of a normal respiratory rate, relatively slow pulse rate, absence of classical signs of pneumonia with evidence of consolidation by x-ray, and a relatively normal leukocyte count, may be suggestive.

The basis for the successful specific therapy of psittacosis is found in the experimental work of Heilman and Herrell,[4] who in 1944 reported that penicillin in enormous dosage given soon after inoculation with the psittacosis virus cured the disease in mice. Bedson and May,[1] in England, similarly demonstrated that psittacosis virus is definitely susceptible to penicillin when in the tissues of the mouse. The amount of penicillin required to keep in check infection with this virus in the mouse to the extent of making the infection subclinical was found, however, to be very great; calculation from mouse to man would approximate 11,000,000 units for a human.

Meyer and Eddie[6] also stress the effectiveness of penicillin therapy early and in large dosage in experimental infections in mice and rice-birds. As to the sulfonamide drugs, although Early and Morgan[2] demonstrated that sulfadiazine therapy was definitely effective, although less so than penicillin, in experimental infections of mice by one strain of psittacosis virus (strain 6 BC), earlier works in animals and in human cases failed to establish sulfonamide drugs as effective agents in this disease. Streptomycin therapy as reported by these same workers was completely ineffective, and the author knows of no evidence contrary to this finding.

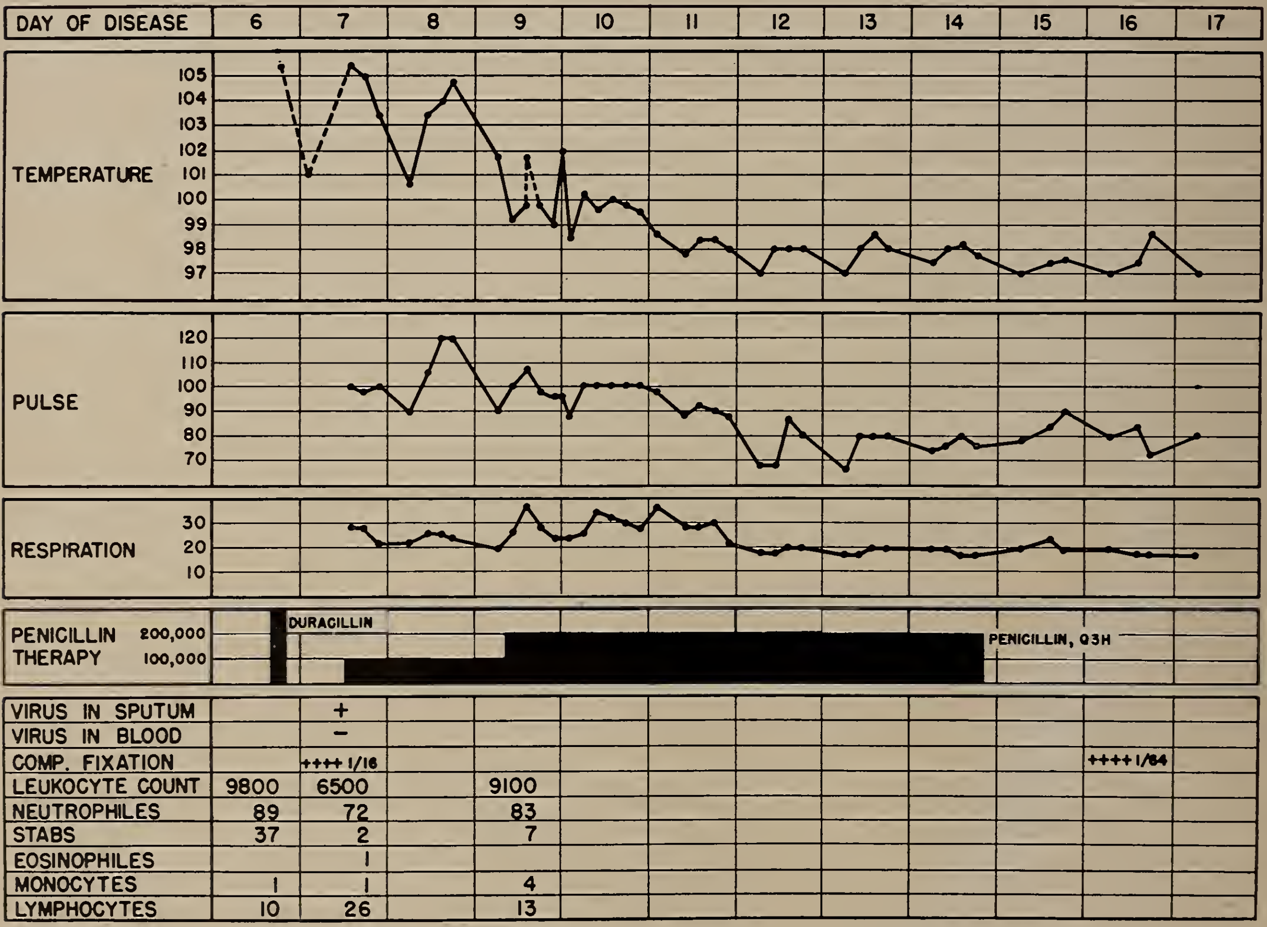
Reports of penicillin therapy of cases of psittacosis in man, with a few notable exceptions, are somewhat disappointing. Therapeutic effectiveness of penicillin in humans with psittacosis is reported by Turgasen,[10] by Flippin, Gaydosh and Fittipoldi,[3] by Parker,[7] and by Kirkwood.[5] It might be noted, however, that the penicillin dosage employed in these cases was very much less than that which would be expected to be effective on the basis of the experimental work to which reference has been made. Moreover, often the penicillin was administered quite late in the course of the disease. Indeed, Parker[7] in his report of two cases of psittacosis in man, concludes in this vein: that not much is to be expected from the dosage of penicillin ordinarily used in reported cases, and that when the temperature falls by lysis in a self-limited disease of two to four weeks' duration, it is difficult to conclude that the penicillin had much to do with the result obtained. Penicillin therapy of humans infected in laboratory with psittacosis virus, as reported by Meyer and Eddie,[6] where the diagnosis and therapy were established early and the dosage of penicillin was relatively large, presents a much more striking picture of the efficacy of such therapy. One such laboratory infection in a man is reported by Rosebury, Ellingson, and Meiklejohn.[8] In that case, penicillin and sulfadiazine in combination were strikingly effective. The infection in that case was known to be caused by the 6 BC strain of psittacosis virus which had previously been demonstrated experimentally by Early and Morgan[2] to be susceptible to sulfadiazine, although in lesser degree than to penicillin.

More closely than in any other reported case of penicillin therapy of non-experimental psittacosis in a human, the circumstances surrounding treatment in the following case report are believed to approach those prevailing in the treatment of laboratory infections. The diagnosis was made and penicillin therapy begun reasonably early in the course of the disease; the dosage of penicillin was very large and the response appeared dramatic (see Figure 1).

CASE REPORT

The patient, a 27-year-old housewife, complained of recurring chills and high fever accompanied by marked gastric and intestinal flatulence and some nausea. She said that five days previously she had had so severe a headache that she had had to go to bed. She took two laxative tablets and shortly thereafter severe diarrhea developed. That night she had shaking chills and fever. In the morning she felt well enough to go shopping, but had frequent watery bowel movements. That evening chills and fever recurred. The following day, a physician prescribed a bismuth compound, empirin and codeine, and the diarrhea and cramps were brought under control. Shaking chills and fever continued, however, with apparent fall of temperature in the mornings to approximately normal. Very troublesome gastric and intestinal flatulence developed and the patient felt very ill and weak. She admitted only a mild infrequent, nonproductive cough. The evening prior to admission to hospital, the temperature was 105.4° F.

Upon physical examination at home it was noted that the patient was obese and appeared to be about the stated age. The skin was warm, moist, and slightly flushed. The patient



DAY OF DISEASE	6	7	8	9	10	11	12	13	14	15	16	17
VIRUS IN SPUTUM		+										
VIRUS IN BLOOD		−										
COMP. FIXATION		++++ 1/16									++++ 1/64	
LEUKOCYTE COUNT	9800	6500		9100								
NEUTROPHILES	89	72		83								
STABS	37	2		7								
EOSINOPHILES		1										
MONOCYTES	1	1		4								
LYMPHOCYTES	10	26		13								

Figure 1.—Graph showing clinical course, pertinent laboratory findings and therapy.

complained of being "choked with gas." There was slight nasal congestion and injection of the fauces. No rigidity of the neck was noted. There were a few crepitant rales at the base of the left lung, but no evidence of consolidation was present. The heart was not demonstrably enlarged, and the pulse was regular at the rate of 100 per minute. Blood pressure was 98 mm. of mercury systolic and 60 diastolic. The abdomen was soft, with slight suprapubic tenderness. There was moderate gaseous distention. The spleen and liver were not palpated. Reflexes were not remarkable; the Kernig sign was negative. The lymph nodes were not remarkable. Leukocytes numbered 9,800.

It was felt that the patient had pneumonia at the left base, but the minimal findings and minimal pneumonic symptoms, the six-day history of distress, the predominance of gastro-intestinal symptoms and a very high remittent fever, were puzzling. In view of the presence of a cage of two canaries in the bedroom, inquiry was made concerning exposure to parrots and other birds. It was found that some two and one-half weeks before, the patient had purchased a canary from a pet shop, where she had played with a parrot. A tentative diagnosis of psittacosis was made and the patient was given 300,000 units of penicillin in oil intramuscularly and was admitted to hospital the following morning.

On the day of admission, the pneumonic findings in the left base were much more definite. The cough was more severe and was becoming productive of thick, glary, treacle-like sputum. Examination of the blood on the day of admission showed hemoglobin value of 13.7 gm. per 100 cc., erythrocytes numbering 4,440,000 and leukocytes 6,500, with neutrophils 72 per cent, including 2 stabs, eosinophils 1 per cent, lymphocytes 26 per cent, monocytes 1 per cent. Specific gravity of the urine was 1.006; it was acid and contained a trace of albumin but no sugar or acetone. The blood sedimentation rate (Wintrobe) was 45 mm. per hour.

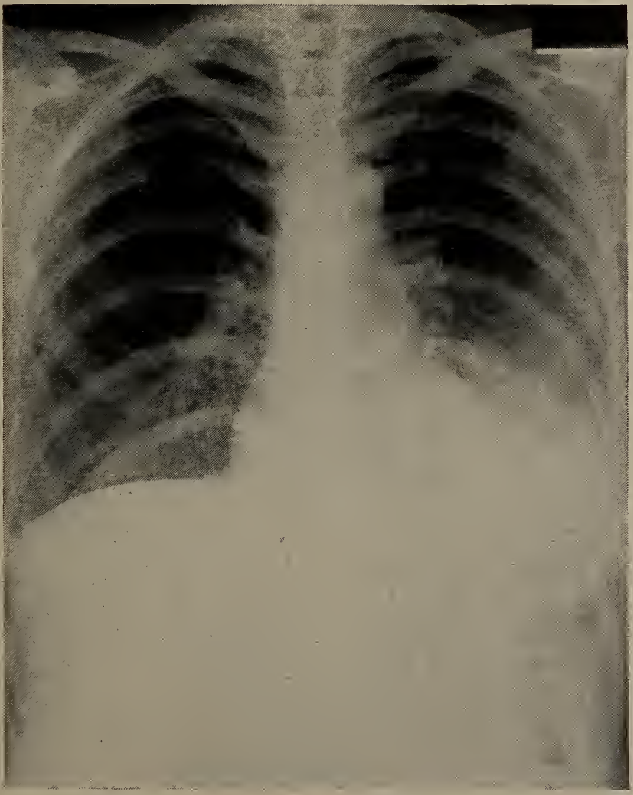


Figure 2.—Roentgenogram of the chest taken on day of admission to hospital, showing pneumonia at left base.

A roentgenogram of the chest showed an irregular area of consolidation at the left lower lobe; the left leaf of the diaphragm was obscured; the lung fields were otherwise clear (see Figure 2). In addition to the usual laboratory studies, blood and sputum were sent to the California State Virus Laboratory for psittacosis studies.

In the hospital, the patient was continued on penicillin therapy, 100,000 units every three hours. The temperature, pulse, respiration and medication are shown in Figure 1. There were sharp rises in temperature in the evening of the first two days to 105° F. and above, with marked toxicity, sometimes feeble pulse and cyanosis of the extremities at the high temperatures. Penicillin dosage was raised to 200,000 units every three hours on the second hospital day. On the third day the patient began to improve rapidly, the cough began to diminish and the sputum became reddish in color, then definitely blood-stained. By the fifth hospital day the temperature returned to normal and remained so, and the signs of consolidation began to clear. On the sixth day, report was received of the growth of psittacosis virus in both mice and cotton rats which had been inoculated with the patient's sputum, and of the presence of a good complement fixation titre for psittacosis in the blood. Another roentgenogram of the chest taken on the eighth day showed only a slight amount of abnormal density remaining in the lung. Blood taken the ninth day showed a rise in complement fixation titre for psittacosis. The patient was discharged on the eleventh hospital day, feeling well, with lungs essentially clear to ausculation.

As soon as the positive laboratory findings became known, the city and state health authorities went into action. The patient's three canaries were sacrificed and examined and although one canary, which had been in the patient's possession for five years, had an enlarged spleen, no psittacosis virus could be isolated from the organs of any of the birds. The pet shop the patient had visited was immediately quarantined. Inquiry disclosed that the patient had been there at least three times during the week in which she had purchased the canary. Blood was taken from the parrot and from five parakeets (a sample of the 14 parakeets in the store). Blood from two of these parakeets showed positive complement fixation titres for psittacosis, but although preparations from the spleens of all five parakeets and the livers of two of them were injected into mice, no virus could be isolated.

In this case, several points appear to be noteworthy. Living psittacosis virus was demonstrated in sputum obtained from the patient almost 24 hours after 300,000 units of penicillin in oil had been given intramuscularly, and six days after the apparent onset of the disease; virus was not demonstrated in the blood obtained at about the same time. Although 300,000 units of penicillin in wax and oil, followed within 18 hours by the institution of a dosage of penicillin of 100,000 units in aqueous solution every three hours, did not appear to produce any marked amelioration in the patient's condition, an increase of dosage to 200,000 units every three hours was closely followed by dramatic improvement. This was many times the dosage previously reported in human cases and approached the dosage used in experimental infections in mice. This high dosage was maintained for perhaps an unnecessarily long period, but was accompanied by prompt and complete recovery without any indication of relapse of the infection. Epidemiological studies failed to demonstrate conclusively the source of the patient's infection; the evidence would indicate that the patient's canaries could be exonerated and that the source of infection was probably infected droppings present in the pet shop from birds other than those sacrificed and tested by animal inoculation. It is believed that this case furnishes strong evidence that penicillin in very large dosage is curative of psittacosis in man.

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Tuberculosis in Childhood

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SUMMARY

Those physicians who deal with children have much to contribute toward case finding in tuberculosis among these patients as well as adults. The tuberculin test is the most accurate weapon at hand. Contacts other than the parents should be looked for. Symptoms, beside fever, to be noted are eye and skin complaints. In the physical examination the chest is relatively unimportant as compared to the eye, the skin, the lymphatic and skeletal systems. In the roentgenographic examination, epituberculosis and atelectasis should be differentiated. When stomach washings are necessary for the diagnosis, the tuberculin test on the guinea-pig should not be forgotten. Careful laboratory studies will clear up roentgenographic confusion.

In the treatment, removal of contact is essential, and often all that is necessary, but other factors should be considered. Of the more common complications, atelectasis, bronchiectasis, and cavitation or reinfection, may be treated surgically with all the accepted methods except thoracoplasty. Heliotherapy should not be forgotten in bone and joint tuberculosis. It is to be hoped that BCG will prove efficacious in vaccination, but published reports are not scientifically convincing. It destroys the value of the tuberculin test where used, and it should never be substituted for removal of contact as a prophylactic measure.

The pediatrician and the general practitioner have a peculiar advantage—or had, at least until recently—in the study of tuberculosis. The pediatrician, who is the general practitioner with practice limited to a certain age group, sees tuberculosis in the full gamut from exposure through the incubation period into the primary infection, and from there into quiescence or complications, to reinfection, arrest, or death. He is more apt to see the story of tuberculosis in its entirety, although this statement was truer in the past than it will be in the future. As a result of efforts to prevent exposure the story is often being postponed until more of it is finished in the older age groups, and even the beginning is more often not seen until adult life is reached. But to all who still doubt that tuberculosis in all its manifest forms is common in children, an invitation is extended to make rounds on a tuberculosis ward for children at the San Francisco Hospital.

What has the pediatrician been able to contribute to the study of tuberculosis from his vantage point, and what does he look for and emphasize about the disease? In other words, what may he teach others?

Assume that the story begins with that test which originated in pediatric practice, the tuberculin, one of the most accurate biological tests known to medical science when properly evaluated. It has suffered much from misinterpretation by those not using it often, but it still gives much more accurate information than the Wassermann test, the sedimentation rate, or the leukocyte and differential blood counts. It might be said to be even more accurate in diagnosis than the finding of acid-fast organisms, which in some locations in the body may not be tubercle bacilli. What enthusiasm there would be for a comparable skin test for the infection of rheumatic fever!

Those who belittle the tuberculin test should remember that as infection in childhood becomes less prevalent, a negative reaction to the test becomes more significant. It is safe to say that if the test is properly made upon a patient who is not suffering or convalescing from another communicable disease and who is not already overwhelmed and moribund from obvious tuberculosis, a negative reaction will rule out tuberculous infection of any type and at any site. A "false negative" will not be seen by the average physician in a lifetime. The tuberculin must, however, be gotten into the skin by either the Mantoux or Craig test (and be given in doses up to 1 mgm., if the Mantoux test is used) before the result can be called negative. A patch test, which a school child may secretly remove soon after application and replace a few minutes before inspection, should, if the reaction is negative, be followed by intradermal testing.

Assume that in routine office or clinic practice, a tuberculin test is positive: It means, in addition to his own infection, that active tuberculous disease has at some time been in that child's environment. The test therefore becomes a potent means of case finding, and, if the child has not already been reported because of his contacts, a much more accurate means of case finding than the roentgenogram. The pediatrician becomes, if he has a suspicious mind, one of the most valuable case finders in the campaign against tuberculosis. Parents and older siblings come to mind first as a source of the disease, but those who work with children should not forget

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the school-teacher, the nurse, permanent or casual, the maid in the house, the cook, playmates, especially older children, the grandparents with the chronic cough of old age, and, in clinic practice, the midwife. Raw milk, occasionally taken as a special treat when visiting country relatives, must be remembered in certain areas.

In asking about symptoms, inquiry should be made as to bouts of unexplained fever or sores that have healed slowly and with thin but ragged scarring. Children are apt to have primary skin tuberculosis caused by being bitten or kissed by someone with active infection or by slight injuries coming into contact with infected material. Inquiry should be made about sore eyes and conjunctivitis, about nodules over the skin, and transient rashes of all sorts not readily explainable.

What may be found in the physical examination that may not be seen often in an adult? Usually nothing in the chest, although signs of fluid may be present, and in any age classical signs of infiltration or cavity may be found. The pediatrician, having popularized D'Espine's sign, has now consigned it to the limbo it deserves, and interns may now be found who are even unfamiliar with the term. Negative findings in an examination of the chest are relatively unimportant, and search should be made for active phlyctenulosis or the scarring therefrom, for erythema nodosum over shins, thighs, arms, forearms, and occasionally forehead or chin, for morbilliform or other rashes that cannot be fitted into a nomenclature. Enlarged lymph nodes must be looked for and the surface of the tonsils inspected. A search should be made for orthopedic deformities. An enlargement of the wrist or a buckle on the spine may be caused by tuberculosis, though the roentgenogram of the chest be as clear as that of a normal infant.

In the evaluation of a case record, roentgenograms of the chest usually come next in sequence. Often the trilogy of primary focus, lymphangitis and lymphadenopathy may be seen, and occasionally thickened pleura. Mention will be made of only the shadows commonly called the epituberculous lesion. Of these there are two types. One is the true epituberculous lesion of allergic reaction with tubercle in the center and edema or cellular elements surrounding it. The other resembles this only in roentgenographic shadow, as it is a collapse due to pressure of a node on a bronchus. It is the more serious lesion of the two, as it may lead to bronchiectasis, and often does. In addition, all types of shadows seen in adults may be seen in infants and children and with the same significance.

Next comes the search for the tubercle bacillus. Stomach washing is now almost routine in all cases of tuberculosis, sometimes during the course of the disease, even in adults. Points to be emphasized here are that the contents should be taken early in the morning before the patient arises and before the aroma of food may empty the stomach. The contents, if acid, should be inoculated into a guinea-pig at once, but otherwise neutralized if three-day pooling is to be done. If the guinea-pig is given a tuberculin test on the day of inoculation and the reaction is negative, it may be tested again on the eighth day. If the stomach washings contained tubercle bacilli, the reaction to the second test will be positive in 95 per cent of cases. This simple test, not as widely used as it deserves to be, will save about a month's time in gathering the information sought.

Of the numerous diseases simulating tuberculosis in childhood, chronic sinusitis with its accompanying bronchitis, coccidioidomycosis, pneumonias, (lobar, bronchial, and Loeffler's), and cystic fibrosis of the pancreas are the ones commonly confused with it. Atelectasis either separately or as part of the disease may complicate the picture. Usually, the confusion is only roentgenographic, as careful history and laboratory examinations will differentiate these from tuberculosis. There are some rarer diseases to be kept in mind, such as Monilia infections, rheumatic lung involvement, tumors and cysts, histoplasmosis, toxoplasmosis, lung abscess and sarcoidosis.

The most important item in the treatment of tuberculosis in childhood is not controversial. It is the complete and absolute removal from contact, and the item need not be elaborated, except to say that it is the ideal of both active and prophylactic treatment.

There is a tendency to minimize the importance of, or to abolish altogether, rest in bed in the treatment of the primary infection. It is, indeed, usually a self-limited infectious disease, but not always. The same may be said of measles, yet nobody would think of advising that children with measles remain ambulant while febrile. The author advises rest in bed during the primary infection as long as there are symptoms attributable to it, while any organisms are found in secretions or body fluids, and until the sedimentation rate has returned to normal. If it be an error to advise this, it is an error on the safe side.

Attention to the diet is especially important in tuberculous children because of the growth factor which is not present in adults. Special attention should be paid to adequate protein, vitamin, and mineral salt intake to replenish the loss by disease, as well as to supply the needs for normal growth.

Of the complications of childhood infection one of the more common and more important is atelectasis from pressure of enlarged lymph nodes, or a bronchial lesion and subsequent bronchiectasis. Wallgren called attention to this 20 years ago, but it has not received much attention in the literature. In the author's experience, bronchiectasis in children, if unilateral and especially if apical, is more apt to be due to tuberculosis than to any other cause. Exudative tuberculosis, with pleural fluid, or cavitation is seen at all ages in younger patients, and is common in later childhood. The study of these types in children called attention to the frequency of basilar tuberculosis at all ages, and led to the demise of the belief that basilar shadows were less apt to be caused by tuberculosis than by something else.

The treatment of bronchiectasis due to tuberculosis and of cavitation is primarily surgical. Children of all ages stand operation well. In pneumothorax, space fillings, pneumoperitoneum, lobectomy or pneumonectomy, childhood is no contraindication. With the exception of thoracoplasty, which is deforming in children, surgical procedures are withstood as well as, if not better than, by adults. Because adolescents may be uncooperative about rest, they are best treated under supervision in sanatoria. A complete plan of treatment should be outlined, and complications anticipated.

Bone and joint tuberculosis should be treated by the orthopedist and pediatrician together. Nearly all patients will be benefited by heliotherapy properly applied, and when usable it considerably hastens the cure. It is a much neglected form of treatment, but the evidence of the benefits is overwhelming.

The treatment of the miliary and meningitic forms by streptomycin has given the very first ray of hope in these forms of the disease; for the first time in history, cures have been reported.

No general discussion of tuberculosis in childhood would be complete without at least a mention of BCG as a means of prophylaxis. It is hoped of course that the optimistic claims for this product will be substantiated. After a quarter century of use of the vaccine, its effectiveness is still controversial, due mostly to the carelessly controlled projects both in Europe and America. In the only reported carefully scientifically controlled series,[1] with alternate cases as controls, no appreciable difference between the two groups was noted. Some of the other studies may have been controlled in this way, but the published reports have not so stated. In reports on the use of BCG the control methods should be exactly stated and the method of selection of controls elaborated upon. The use of BCG almost completely destroys the value of the tuberculin test in case finding, as its use is usually confined to the heavily infected groups where case finding is most important. BCG vaccination should never be considered a substitute for removal of contact.

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The Significance of "Albuminuria" (Proteinuria)

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SUMMARY

"Albuminuria" is an inadequate term; proteins other than albumin commonly appear in the urine.

Proteinuria seems to depend upon failure of the tubules to reabsorb protein which has filtered through glomeruli. Its occurrence may be the result of abnormal plasma proteins, glomeruli or tubules. Proteinuria need not always be the result of a renal lesion, but may actually cause one.

When proteinuria is discovered, it should arouse curiosity about the patient in general, not merely about his kidneys. Other clinical information is needed in order that treatment be directed appropriately.

THE heat and acetic acid test for "albumin" in the urine has now been in use for two and one-half centuries; particularly since the reports of Richard Bright over 100 years ago, a positive reaction to the test has generally been considered indicative of kidney disease and is too often regarded as evidence of nephritis. Actually, "albuminuria" is found in a great variety of conditions, both with and without anatomic renal abnormalities.

We are just coming to realize the qualitative as well as quantitative limitations of this remarkably ancient method of urinalysis. In the first place, albumin is not the only protein which will precipitate from acid urine under the influence of heat; so will the several globulins normally present in the plasma, as well as hemoglobin and Bence-Jones protein which are occasional abnormalities. Even when albumin is truly present, and especially when it is in large quantities, the normal globulins also escape into the urine.[20] Perhaps the urinary loss of complement and of gamma globulin with its antibodies may be related to the well-known susceptibility to infection of individuals with the nephrotic syndrome.

The fundamental mechanisms responsible for proteinuria are not yet fully understood. It was made clear by Bieter[6] some years ago that certain methods which produced proteinuria in fish possessing glomeruli failed completely to do so in species in which the kidneys were aglomerular; protein must pass via the glomerular filtrate before it appears in the urine. On the other hand, glomerular filtrate has been regarded as protein-free in the absence of glomerular injury. Normal urine is also apparently free from protein until more sensitive tests are employed, whereupon it is found that even normal individuals excrete protein (at a rate of less than 0.1 gm. daily). There is probably no fluid in the body which is entirely free from protein, and more recent studies [8, 22, 28, 32, 33] have in fact succeeded in demonstrating the presence of protein in mammalian glomerular filtrate. Assuming[13] even as little as 10 mgm. of protein per 100 cc., the daily production of 180 liters of glomerular filtrate should contain 18 gm. of protein. More than 17.9 gm. has disappeared before the urine is completely elaborated, and this has almost surely been reabsorbed by the renal tubule cells.

Proteinuria, then, could occur with normal glomeruli whenever the tubules are unable completely to reabsorb the proteins of the glomerular filtrate. The tubular load would be greater if more protein filtered past the glomeruli; this occurs with normal plasma proteins and diseased glomeruli, but could also result even with normal glomeruli if the plasma contained proteins with physicochemical properties (size and shape in particular) which facilitated their passage through normal capillaries of the tufts; hemoglobin, egg-albumin and the Bence-Jones protein seem to be such proteins.[4, 8] Finally, it appears that the tubules cells may become functionally and anatomically damaged under conditions of this sort,[2, 12, 25] eventually allowing passage of yet more protein with final disorganization of the kidneys.

The proteins in question need not be exotically abnormal ones. Thorn induced proteinuria, in patients with chronic hepatitis but previously without proteinuria, by repeated infusions of human serum albumin.[31] Others have since provoked proteinuria in entirely normal human subjects by similar means, extending earlier observations of the same sort in experimental animals.[24] Such proteinuria in the absence of a primary renal lesion might conceivably occur as the result of spontaneous aberrations in the formation of the plasma proteins; from time to time it has been suggested that pure lipoid nephrosis is a metabolic disturbance rather than primarily a renal one.[17] Addis has shown decisively in at least one patient[2] that it is possible to observe proteinuria before the appearance in the urine of casts and especially renal tubular cells—that is, before objective evidence of a renal lesion. Others have recorded hypoproteinemia and edema preceding proteinuria in rare instances,[15, 18] and there is even a poorly documented report of normal renal tissue by biopsy early in the course of the nephrotic

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syndrome. The relative importance and frequency of this sequence of events remain to be determined, but it should be noted that Addis[3] has seen a score of patients in whom he considered that tubular degeneration was caused by abnormalities of plasma protein formation.

Quantitatively, the heat and acetic acid test leaves much to be desired. Measurements of the rate of proteinuria in grams per 24 hours are a diagnostic aid as well as a necessity before dietetic therapy. The normal minute rate of proteinuria occasionally yields a cloud when heated acid urine is sufficiently concentrated, while minor degrees of abnormal proteinuria are lost in dilute specimens. Moreover, differential diagnosis is facilitated: 20 gm. of protein per day, for example, is found in glomerular nephritis but not with pyelonephritis, renal arteriosclerosis, orthostatic albuminuria, etc.[3]

One may observe variable rates of proteinuria under certain conditions, as with the upright position or exercise in subjects with orthostatic albuminuria. In this state, careful search usually reveals casts and renal cells indicative of a transitory renal lesion which disappears *entirely* soon after the recumbent position is reached;[27] it is occasionally necessary to have the subject empty the bladder after he has been in bed for an hour or two (voiding without arising) before starting the collection of nocturnal urine. In view of the preceding discussion, it might be recorded here that in some subjects with orthostatic albuminuria the diurnal appearance of proteinuria fails to precede that of casts and renal cells in the urinary sediment; all occur simultaneously within an hour or so after the subject stands. Attention might also be directed again to the occasional gross abnormalities found by intravenous pyelography of such subjects.[26] In a unique patient, proteinuria (noctalbuminuria) appeared only during the hours of sleep,[14] a finding which reminds one of individuals with paroxysmal nocturnal hemoglobinuria.

Even when there is an underlying renal disorder which is presumably constant, the rate of proteinuria is variable. It is increased by the upright position, exercise and fever.[5] Similar increases follow the infusions of albumin into patients with the nephrotic syndrome,[21, 30] as they do after transfusions of plasma or whole blood. Congestive heart failure elevates the rate, or at times appears to provoke proteinuria. Conversely, rest in bed diminishes the rate of proteinuria, but this is not to be taken as a therapeutic suggestion for the patient with a chronic renal lesion. Some observers have found that the administration of alkalies reduces proteinuria,[5] abolishes it in some subjects with benign proteinuria, and even prevents it after exercise. This phenomenon may be related to, but is as yet distinct from, the solidification of protein into casts;[22] in this connection, the earlier alleged value of alkalinizing the urine after intravascular hemolysis has been questioned.

Increased rates of proteinuria have also been found during periods of high protein intake by patients with chronic glomerular nephritis;[5, 7, 16] such diets have similar effects in animals with experimental renal disorders.[1, 11] It is also true that low protein diets are followed by less proteinuria, but this is not thought to be the reason for the efficacy of such diets in therapy; the work of Addis[3] should be consulted on this point.

Variations in the rate of proteinuria are not necessarily accompanied by parallel changes in the intensity of the renal lesion or by fluctuations of renal function in the clinical sense. We have failed to find increases in rates of excretion of casts or of renal tubular epithelial cells when infusions of human albumin magnified proteinuria in patients with the nephrotic syndrome, and have observed simultaneous reductions in previously elevated concentrations of creatinine and urea in the serum of those individuals. It seems likely that at least the more abrupt alterations in rate of proteinuria are brought about by variations in renal blood flow and glomerular filtration rate, as well as by changes in the concentration of albumin in the serum.

It scarcely need be said that one does not treat the symptom "albuminuria," but rather the patient whose urine contains protein. Even a diagnosis is not sufficient; therapy also depends upon the patient's story, complaints, and the results of physical examination and of a few, simple laboratory procedures. Among the latter are a reliable measure of one of the non-protein-nitrogenous substances in the serum for the detection of renal insufficiency, and roentgenograms of the kidneys (preferably with intravenous pyelography) when chronic pyelonephritis is suspected. Even more important is the intelligent examination of satisfactory specimens of urine, with particular reference to the sediment and sometimes to bacteriologic study.

In some patients it will be found that no treatment at all is indicated, as when proteinuria appears only after exercise, cold showers, or injections of epinephrine, or when it occurs in individuals with sunburn or orthostatic albuminuria.

At other times the kidneys may be ignored at least temporarily while therapy is directed elsewhere. For example, penicillin is needed for the nephrotic syndrome in early syphilis, or British anti-Lewisite (BAL) for mercury poisoning, or surgical relief of the obstructive jaundice which has produced "bile nephrosis," etc. The need for extrarenal measures is even more important in the toxemia of pregnancy, and it should be remembered that minor degrees of proteinuria and elevation of non-protein-nitrogen in the serum do not contraindicate the use of diuretics when congestive heart failure is the chief problem.

At still other times, treatment of the patient with proteinuria and a chronic renal lesion (glomerular nephritis, pyelonephritis, polycystic kidneys, etc.) consists primarily of an adjustment in his protein intake. In this discussion of the significance of proteinuria there is no place for any extensive section on dietetic management, but one point is both pertinent and important: It is imperative that the rate of proteinuria be measured occasionally so that amounts of protein equivalent to the daily loss can be added to the restricted intake in order to assure adequate nutrition.[3]

Other problems in treatment can be no more than mentioned: small amounts of sulfonamides in chronic pyelonephritis, adjustments in the intake of sodium salts during the nephrotic syndrome or with uremia, the use of Southey's tubes or infusions of albumin for edema.

ADDENDUM

Five important contributions relating to the mechanism of proteinuria have become available since this review was submitted for publication. Bull[10] has found increased pressure in the tributaries of the inferior vena cava in subjects with orthostatic proteinuria; he offers evidence that this syndrome results from compression of the vena cava by the liver. Whipple's group[29] studied the effects of raising the serum protein concentration in dogs by means of infusions of plasma; massive proteinuria so produced cleared within one to four days after the last infusion, and the kidneys were normal histologically. Lippman[19] reported that the clearance of hemoglobin by the rat kidney was doubled by intraperitoneal injections of bovine albumin; he suggested that the tubular protein reabsorption mechanism was saturated and that glomerular permeability to hemoglobin increased under the experimental conditions. Brandt and Gruhn[9] provoked proteinuria in rabbits by strongly pressor doses of renin. Their data permitted calculation of the concentration of protein in glomerular filtrate, which was found to be of the order of 11 to 33 mgm. per 100 cc., and they concluded that renin did not increase glomerular permeability to hemoglobin. Oliver[23] has described in detail the structural changes which appear in the cells of the proximal convoluted tubules during experimental proteinuria.

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The Treatment of Sinusitis in Children

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SUMMARY

The sulfonamides and antibiotics have been of great value in reducing the duration and severity of acute sinusitis in children.

Chemotherapy, in the acute case, will probably prevent much chronic sinusitis of the infectious type.

The most common variety of chronic sinus disease is due to a primary allergic condition plus secondary infection. It is impossible to treat these cases successfully without treating the allergy as well as the infection.

The home use of any nose drop preparation is of very little value in the treatment of chronic sinusitis of any type or localization.

The local nasal use of sulfonamides or antibiotics is not based upon rational principles. Their clinical value is negligible. They may, moreover, be decidedly irritating to the nasal mucosa.

One should not hesitate to resort to rational surgical procedures to improve nasal ventilation in a child with sinusitis.

While the advent of chemotherapeutic, antibiotic and antihistaminic drugs has been of inestimable value in the treatment of chronic sinusitis, we must not neglect to surgically correct anatomical defects and irreversible pathological mucosal changes which interfere with proper nasal physiological processes.

THE treatment of sinus disease in children has occupied the attention of many otolaryngologists and pediatricians since Dean first introduced its importance to American medicine about thirty years ago. This is a discussion of modern sinus therapy in children based upon etiology and anatomical localization of the disease, with consideration of the usages of newer drugs. It is impossible to generalize in discussing the therapy of this condition, inasmuch as one is dealing with a host of different diseases. The methods of treatment suggested are not original. This is rather an attempt to simplify and correlate well known methods according to personal practice.

PATHOLOGICAL CLASSIFICATION

It is necessary to precede this discussion with some type of classification. The factors of age and physiological status are important in these conditions as in all others. However, two important aspects must be stressed in a classification of sinus disease. These are etiology and anatomy.

A. *Etiologic classification:*

1. *Infection:* The infectious inflammatory processes in the sinuses are produced by the common respiratory organisms, in which staphylococci and streptococci predominate in that order. The pathological changes are the usual changes in infection and are characterized chiefly in the sinuses by mucosal edema, exudation, pus formation, hyperplasia, fibrosis, and osteitis.

2. *Allergy:* Allergic processes very commonly have their major seats within the paranasal sinuses, as well as within the nose proper. The pathological end results of allergy include edema, hyperplasia, polyposis, fibrosis, with the secondary sequelae of mechanical obstruction and ostial blockade.

3. *Miscellaneous* etiologic factors include many things. (a) *Metabolic dyscrasias,* such as hypothyroidism and other endocrinopathies may produce changes in the mucosa of the upper respiratory tract. (b) *Neurovascular factors* may produce instability in the blood vessels of the sinus mucosa and give rise to pathological changes resembling those in allergic conditions.

B. *Anatomical classification:*

1. *The maxillary sinus* is usually present at birth. It is by far the most important sinus anatomically and clinically, in the child as well as in the adult. This statement is made with due regard to the fact that the ethmoid, in the past, has been accorded this place of importance. We must remember, however, that the maxillary sinus is a very small sinus at birth and embryologically represents an outgrowth from the middle meatus. Its relationship to the inferior meatus is relatively distant in infancy and the very narrow medial-lateral diameter of the sinus must be constantly kept in mind in the very young child. The lateral aspect of the sinus in the infant rarely goes beyond the line of the infraorbital canal. It is only in the older child that the maxillary sinus extends laterally to this structure. This must be kept in mind in all manipulations made either through the inferior meatus or through the canine fossa.

2. *The ethmoid labyrinth* is always present at birth. The cellular development within the ethmoidal labyrinth, which is at first a primitive solid structure, is quite variable. The ethmoid labyrinth in the past was considered to be the most common site of sinus disease in the young child, even to the exclusion of the maxillary sinus. However, our experience has

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been somewhat different. Anatomically, both maxillary and ethmoid sinuses are present at birth. By virtue of location and size the maxillary is of greater importance clinically than the ethmoid labyrinth. However, the ethmoid labyrinth, because of its relationship with the medial orbital wall, produces the occasional picture of orbital cellulitis accompanying ethmoiditis.

3. *The sphenoid sinus* develops at approximately the age of five or six years as a pneumatized anatomical entity. However, the sphenoid sinus may be pneumatized as early as the first year of life. It has been a rare seat of osteomyelitis and sepsis in infancy.

4. *The frontal sinus* begins to develop clinical-anatomical importance at about the eighth or ninth year of life. However, in rare instances a frontal sinus has been of clinical significance at two or three years of age. Usually it is not demonstrable anatomically at birth.

DIAGNOSTIC ASPECTS

It is not within the province of this paper to enter into the rather lengthy and important subject of diagnosis of sinus disease in children. However, a few important diagnostic aphorisms will be briefly mentioned:

1. The presence of profuse mucoid or mucopurulent discharge in the nose does not necessarily indicate the diagnosis of sinusitis.

2. The complete absence of secretion in the nose or nasopharynx does not necessarily rule out sinusitis.

3. Chronic cough in a child is frequently due to an undiagnosed latent sinusitis, frequently in a unilateral maxillary sinus.

4. Sinusitis often is incorrectly diagnosed in children who actually have only pharyngeal and nasal tics due entirely to psychosomatic factors.

5. Transillumination in the child is occasionally a false guide in diagnosis.

6. The demonstration of eosinophilia does not necessarily prove that one is dealing with a purely allergic nasal condition.

7. The lack of eosinophilia does not rule out allergic conditions.

8. Headache is not a common symptom of sinus disease in children, unless it is present during an acute frontal or ethmoid sinusitis. It is not at all a common finding in chronic sinus disease in children. If it occurs, some other cause should be searched for.

TREATMENT OF ACUTE INFECTIOUS PANSINUSITIS IN THE INFANT

The infant under the age of 18 months, with the clinical picture of acute pansinusitis, either unilateral or bilateral, of purely infectious type, will have toxemia, fever and classical clinical findings of bacterial invasion. In these infants we are usually dealing with an acute maxillary plus ethmoid infection. Very rarely is the sphenoid involved. The frontal sinus usually does not exist at this age. The following plan of treatment is usually adequate:

A. *Chemotherapy:* This should include the most suitable chemotherapeutic agent as indicated bacteriologically. Usually sulfadiazine and penicillin, or either alone, will be adequate chemotherapeutic weapons. Sulfadiazine and penicillin together show a somewhat better clinical effect than either alone. However, if for reasons of sensitivity to either one of the drugs the other must be used alone, good results may still be obtained. Chemotherapy must be intelligently chosen to meet the bacteriological needs and must be in sufficient dosage to be adequately bacteriostatic and bactericidal. Finally, it must be administered over a long enough period of time to allow for complete subsidence of the infection without the possibility of masking and recurrence.

Penicillin is best administered parenterally, of course. We have had excellent results, in spite of occasional local reactions, with the 300,000 units in oil and novocain preparation. Recently oral penicillin has shown value provided it is given in sufficient doses. No dosage of less than 100,000 units by mouth, every three or four hours, is of value even in an infant. Naturally all the toxic reactions and all the dangers of chemotherapy should be carefully kept in mind.

B. *Environmental aspects:* It is important in the treatment of acute infectious sinus disease in an infant to keep the child in a room where the humidity and temperature can be kept within uniform limits.

C. *Local therapy:* This must not be too vigorous. It should be limited to:

1. The gentle removal of thick nasal secretions by suction with a rubber bulb every few hours and followed by

2. The instillation of a few drops of a warm isotonic and non-irritating vasoconstrictor of neutral, or slightly acid, pH into each nostril.

In my experience there has been no evidence of clinical effect from the use of either sulfonamides or antibiotics as nose drops. All I have seen as a result of penicillin, sulfa, tyrothricin, and streptomycin nose drops, is an irritative reactive vasomotor rhinitis, which sometimes does the patient more harm than the original disease for which he was treated. There is no rationale pathologically for the employment of these drugs locally. The infectious process is in the submucosa. There is no particular value to the instillation of chemotherapeutic agents which usually cannot even penetrate the thick purulent coating on the nasal mucosa. Indeed, by their irritating action these drops may destroy whatever functional efficiency still remains in the mucous blanket and cilia. The only reason for the use of a vasoconstrictor is to allow for the creation of a better airway which in turn will allow for the removal of secretions and better ventilation of the sinuses.

The infected nasal mucosa is desperately battling the invasion of bacteria by the use of ciliary activity and the mucous blanket. Nothing should be done that will destroy this ciliary activity or jeopardize the integrity of this mucous blanket. In utilizing nasal preparations, it must be remembered that pH and isotonicity are two different things. An isotonic preparation may have a pH far too alkaline for the nose, and a neutral pH preparation might not be isotonic in nasal secretions. When we discuss pH we are talking about acid base balance and when we talk about isotonicity we are talking about osmotic pressure. While the two are related they are two different concepts, physically and chemically.

D. *Sympathicomimetic and antihistaminic drug therapy:* In those cases characterized by intense vasomotor collapse of the nasal mucosa, where there is a profound edema interfering with the airway, it is frequently of value to employ sympathicomimetic and antihistaminic drugs by mouth, in addition to the already mentioned treatments. Of these drugs propadrine hydrochloride and pyribenzamine have been of greatest value.

THE SURGICAL TREATMENT OF ACUTE ETHMOIDITIS WITH ORBITAL CELLULITIS OR ORBITAL ABSCESS

In this very classical picture which we are seeing rather rarely today, since the advent of chemotherapy, the child usually has marked swelling of the orbit. The upper lid is usually very red and edematous, especially in the medial orbital area.

Most cases will respond to the therapy outlined above. However, if there is no quick clinical response, surgical intervention is in order.

The incision is made in a curved fashion approximately 1 cm. medial to the inner canthus, over the nasal bone, and is carried through the skin and periosteum down to the bone. The periosteum is reflected laterally from the lamina papyracea, and usually free pus will be encountered subperiosteally. If no free pus is encountered, the lamina papyracea and the lacrimal bone itself may be removed, at which time the ethmoid labyrinth is usually found to be full of thick mucopus. The wound is left open with a rubber tissue drain in place. Obviously the medical regimen described above must also be continued until resolution of the disease.

SURGICAL TREATMENT OF ACUTE FULMINATING FRONTAL SINUSITIS

This disease is not a disease of infants, but may very well be a disease of older children. We have seen it in children of seven and eight, but it is more commonly found in the older group in the 'teens. Surgical treatment is only resorted to when the medical treatment previously outlined has been employed for a sufficient length of time to demonstrate its lack of effectiveness. This should not be too prolonged. In a child with actual edema of the orbit or brow, such general medical treatment should rarely be used alone for more than 12 hours. If there is no clinical response within that time, and the pain, tenderness, fever, and swelling persist, then surgical treatment is urgently indicated.

If there is obvious evidence of a subperiosteal abscess, then there is no rationale to medical treatment other than as an adjuvant. In these cases operation is imperative at once, in order to prevent the all too frequent incidence of spreading osteomyelitis in the skull and intracranial complications which are frequently fatal. In such cases the patients should be treated surgically externally only. The mucosa of the nose should not be meddled with. The operation of choice is the trephine of the floor of the frontal sinus in its medial aspect, as described by Dr. J. Mackenzie Brown. This area is entered by the use of a burr or chisel. The mucosa is usually not touched unless there are signs suspicious of intracranial invasion; but if there are such signs the posterior mucosal and bony wall of the sinus may be stripped and removed to expose the dura. In the absence of intracranial signs, the sinus is merely entered and a large rubber tube drain is inserted through the trephine opening. No intranasal operation is done, and the nasal frontal duct is left alone. Postoperatively the patient should be kept on the intensive medical regimen outlined above. The patency of the tube into the frontal sinus must be maintained at all times without question. These patients usually respond to trephine plus medical treatment in a very few days. When the discharge from the frontal drain ceases and when the nasofrontal duct appears to be perfectly patent (as studied by the return of a colored solution through the nose when injected into the frontal sinus via the rubber drain) it may safely be withdrawn and the wound allowed to close by itself. The incision should be made immediately below the unshaved eyebrow. Usually no scar results.

THE SURGICAL TREATMENT OF ACUTE MAXILLARY SINUSITIS WITH ORBITAL CELLULITIS OR ABSCESS

This is a rather rare occurrence. However, several cases have been seen in the Children's Hospital, Los Angeles, within the past few years. In cases of this type an incision is made below the lower lid above the inferior orbital rim. The elevation of the periorbita over the floor of the orbit is continued until a break in the bone of the orbital floor or antrum roof is encountered. A rubber tube drain is inserted.

In considering the treatment of acute infectious sinusitis in childhood, the acute infection of the sphenoid is not mentioned because it is an extremely rare entity and would theoretically, unless accompanied by osteomyelitis, respond nicely to intensive medical therapy. It is only the sinuses which have external topography that occasionally require the employment of external surgical operations for the purpose of expediting better drainage.

THE TREATMENT OF ACUTE ALLERGIC SINUSITIS IN CHILDREN

This is a severe form of allergic rhinitis characterized by severe rhinorrhea, nasal obstruction, mucosal edema, severe pruritus of the nose and pharynx, sneezing, and lacrimation. It is incorrect to speak of it as acute sinusitis; it is acute panrhinitis and panrhinosinusitis due to an allergic condition. The terms "sinusopathy" and "rhinopathy" would be more appropriate in this sense than sinusitis and rhinitis. It is important to remember a few dicta in the treatment of this disease:

A. Avoid local therapy. Nose drops of all types are contraindicated in this condition.

B. Enforce all dust and anti-inhalant allergen precautions.

C. Temporary elimination diet of the common food offenders, regardless of skin tests, and regardless of results of previous food elimination tests, should be effected. These common foods which should be eliminated are milk, eggs, wheat, chocolate, citrus fruits, and their derivatives.

D. Intensive oral medication with sympathicomimetic amines such as propadrine, ephedrine and neosynephrine, plus the employment of antihistaminic drugs, such benadryl, pyribenzamine and others, will prove of great value in reducing the temporary severe mucosal edema, pruritus and rhinorrhea.

CHRONIC SINUS DISEASE IN CHILDREN

There are three types of chronic sinus disease in children.

A. Pure infectious sinusitis. This is rare in children.

B. Pure allergic sinusopathy and rhinopathy is not common in children.

C. Mixed allergic and infectious sinusitis is very common in children and is perhaps the most common type of chronic sinusitis encountered in the child as well as in the adult.

TREATMENT OF CHRONIC INFECTIOUS SINUSITIS IN CHILDREN

This is a self-limiting and self-curative condition, usually, if the mechanical and contiguous infection factors are eliminated. Local therapy to the sinuses is rarely necessary. The localization is usually in the antrum primarily and ethmoid secondarily. The sphenoid and frontal sinuses are only rarely involved in children. This disease is usually unilateral but may be bilateral.

A. *Mechanical factors:*

1. Obstructive adenoid mass. This may be obstructive because of (a) its intrinsic large size; (b) congenitally small and narrow nasopharynx.

2. Septal obstruction produced by a major deflection, usually of traumatic origin either in the anterior or superior aspect of the nasal septum. These deflections should be corrected, if they actually are of such location and of such magnitude as to constitute truly obstructive lesions. Minor septal deflections should not be touched. They are probably not significant etiologically. Septal operations in children are not contraindicated, provided they are done with adequate attention to replacement and reconstruction of the septal cartilaginous framework.

B. *Contiguous or adjacent infection:*

1. Infected tonsils and/or adenoids. Very obviously an obstructive adenoid is of significance from the standpoint of poor nasal ventilation. However, infected adenoid tissue or infected tonsils will frequently be a reason for continuous reinfection of chronic maxillary sinusitis. In the removal of tonsils and adenoid in a case of sinusitis, it is very wise to employ preoperative and postoperative chemotherapy because frequently chronic sinusitis may be thrown into an acute exacerbation immediately following the tonsillectomy and adenoidectomy. Usually this can be avoided by preoperative and postoperative chemotherapy.

2. Infected lateral pharyngeal bands, and infected lymphoid follicles of the nasopharynx, may be the cause of recurrent attacks.

3. Infected teeth, especially anterior upper teeth, may be very important in constant low-grade infection of the maxillary sinus floor.

C. *Local treatment:*

This is frequently unnecessary. Most cases will subside spontaneously if infected tonsils and nasopharyngeal lymphoid tissues are removed. Occasionally, a short series of simple nasal irrigations with warm Ringer's solution may be necessary as adjunctive treatment. Such irrigations are of great value in the mechanical removal of nasal secretions and the heat in itself may possibly be a physical factor in producing the spontaneous expulsion of thick mucopurulent masses from the maxillary sinus. Nasal irrigation is of greatest value in the subacute type of maxillary sinusitis. It is of moderate value in the chronic case. Antrum punctures are occasionally necessary. Diagnostic puncture and irrigation of an antrum frequently is done at the time of tonsillectomy and adenoidectomy. Such a procedure frequently has a marked therapeutic value as well if the secretion is thick and tenacious. One such antrum puncture may be sufficient to initiate good antral ventilation and drainage.

Very rarely, when the material obtained on antrum irrigation is pure creamy pus, an antrum window may be made to facilitate and expedite further irrigations. The Caldwell-Luc operation is practically extinct in the present-day therapy of pure infectious maxillary sinusitis in children.

Displacement therapy (Proetz treatment) is of distinct value in those cases in which localization is primarily in the posterior group (ethmoid-sphenoid). Since this variety of sinusitis is relatively uncommon in children, the displacement treatment does not have wide usage in pediatric rhinology.

X-ray therapy and vaccine therapy in this condition are of little or no value. There is some value in chemotherapy in a prolonged course, using relatively small doses.

TREATMENT OF CHRONIC PURE ALLERGIC SINUSITIS

This is essentially the treatment of allergic rhinitis and requires no specific measures for the paranasal sinuses. The treatment may be outlined as follows:

A. Elimination of offending foods.

B. Avoidance of dust and other environmental inhalant allergens.

C. Desensitization to inhalants such as pollens, dust and molds by injections. This is not always a necessary or advisable step.

D. Correction of factors in the home producing faulty heating and humidity.

E. Avoidance of local nasal medication.

F. Conservative removal of obstructive and pedunculated irreversibly edematous mucosal polypoid masses.

G. Reduction of chronic mucosal edema of turbinates by judicious conservative cauterization.

TREATMENT OF CHRONIC MIXED ALLERGIC AND INFECTIOUS SINUSITIS

This syndrome is very common. Allergic rhinopathy in some children predisposes to secondary infections. Infectious sinusitis frequently conversely acts as an exciting factor in latent allergy. The end result is a disabling chronic disease with a train of symptoms throughout the body. Cough, fever, wheezing, headache, urinary complaints, and gastrointestinal upsets are frequently seen. It is a generalized disease, a pediatric problem with rhinological aspects. The treatment of chronic mixed allergic and infectious sinusitis in children should be outlined as follows:

A. *Adequate pediatric care* with particular attention to nutrition, basic hygiene and psychosomatic orientation.

B. *Treat the infectious aspect.*

1. Eliminate mechanical factors, such as obstructive adenoid, and major septal obstructions.
2. Remove contiguous infection in the tonsils, adenoid, pharyngeal hyperplasia, and the teeth.
3. Local treatment is of limited value, far more limited than in the purely infectious type.
4. Chemotherapy is of limited value in some cases.

C. *Treat the allergic aspect.*

1. Food elimination by trial and error. Obviously nutritional balance should be maintained by adequate substitution and replacement of vitamins and minerals.
2. Eliminate dust and inhalants.
3. Inhalant desensitization. This is not very frequently necessary in the child. Because of the frequent bad psychic sequelae of a prolonged series of injections, such desensitization should be considered the very last resort in pediatric cases.
4. Maintain good airway by conservative removal of polypoid tissue plus cauterization.
5. Adjunctive administration of sympathicomimetic and antihistaminic drugs.

It is impossible to obtain clinical improvement in this large and troublesome group of cases unless each patient is individualized, carefully studied and treated from the infectious and allergic standpoints simultaneously.

2007 Wilshire Boulevard.

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The Semiautomatic Rapid Film Changer

Its Use in Radiography and the Recording of Rapid Physiological Movements

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SUMMARY

A rapid cassette changer developed at Stanford University Hospital has been successfully used to record, radiographically, swift vascular flow and intrinsic motion of other hollow organs. This aids diagnosis of disease and study of normal physiologic motion.

Contrast cardioangiography and angiography are now well established methods of radiologic diagnosis. Successful angiography requires a rapid series of roentgenograms to follow the opacified blood through the great vessels and cardiac chambers. To date, cinematography of the fluoroscopic screen has not proved satisfactory for work of this type and most investigators have used full-sized

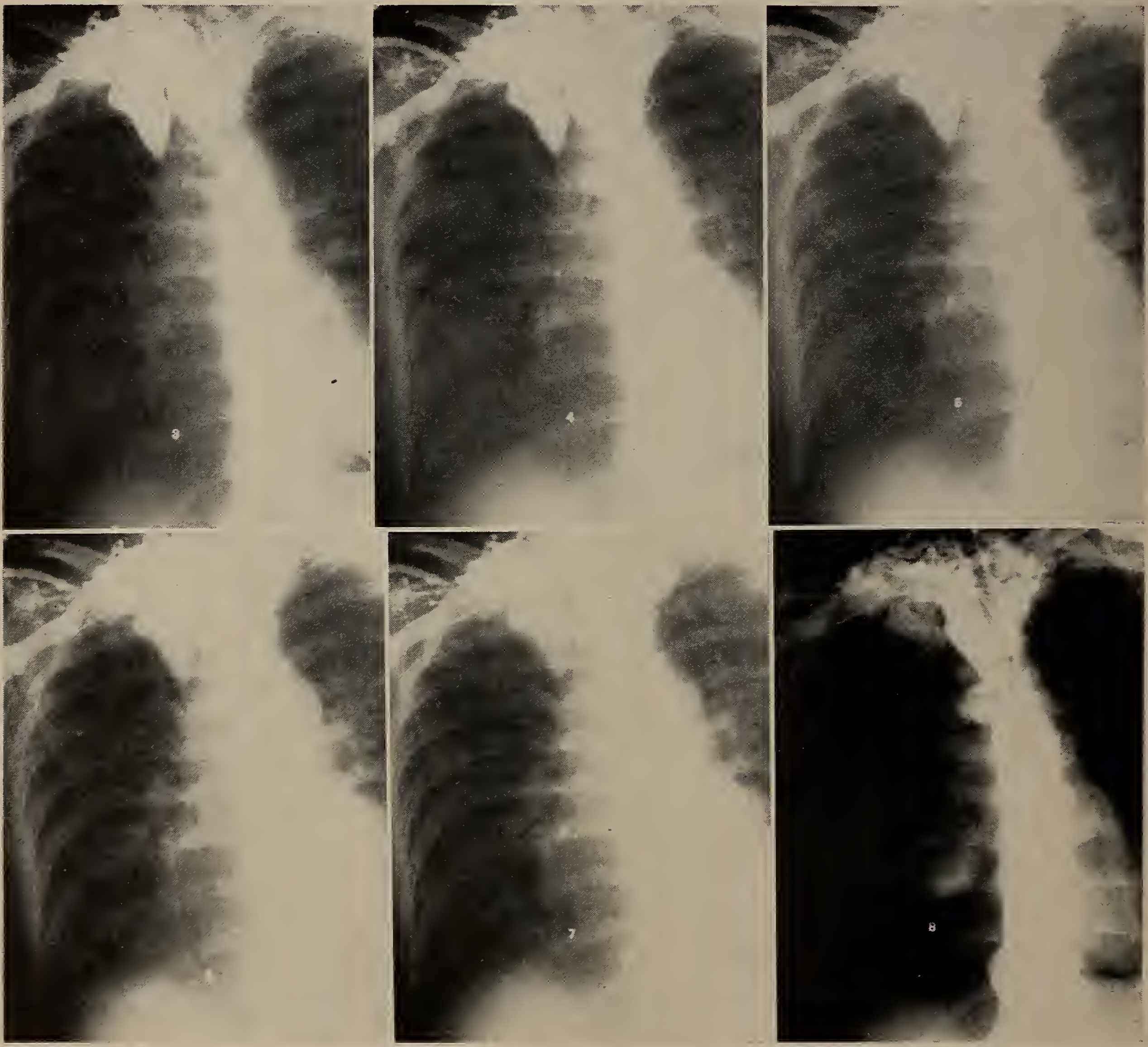

Figure 1.—Serial roentgenograms (time interval between roentgenograms 4/5 second) on a 50-year-old woman. Forty cc. of 70 per cent Diodrast was injected into the left cubital vein. The progress of the opacified blood can be followed as it visualizes the occluded superior vena cava and the collateral circulation.

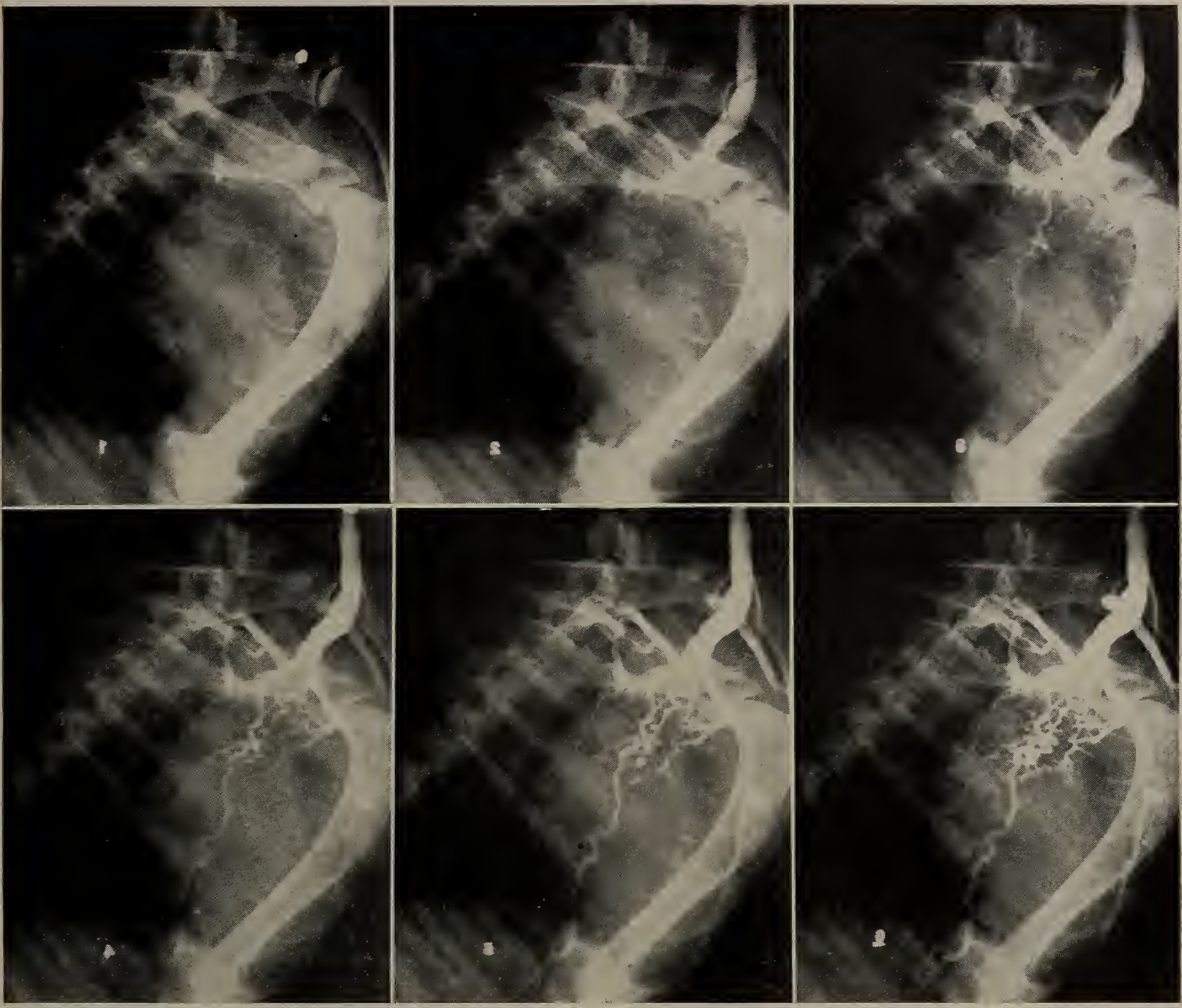

Figure 2.—Serial venograms on an experimental ligation of the superior vena cava in a dog (time interval between radiographs approximately 3/5 second) are an example of the use of the rapid film-changing technique in research of vascular disorders. Note the successive visualization of newly developed collateral veins and the differences in time required for the opaque blood to flow through the veins of differing caliber.

films. In the present state of technical development, the ideal for recording swift movements and vascular flow is a series of conventional full-sized radiographs taken as rapidly as possible. At Stanford University Hospital a satisfactory rapid cassette changer has been developed for this purpose. Films measuring 11 x 14 inches are exposed at a rate of one or two per second to a total of 20 films if the tube will bear so many.

This rapid cassette changer has been used for a variety of examinations with success in recording phases of physiological motion or the progress of opaque material.

The purpose of this paper is to present a few examples of the many possible applications of the rapid cassette changer to investigative and diagnostic radiography and physiology. Pertinent physiologic facts are discussed briefly in each case.

PHLEBOGRAPHY

The venous system is subject to many unpredictable changes in anatomic structure, pressure and rate of blood flow. During inspiration, the blood is sucked into the thoracic cavity and flow is increased, while during expiration the reverse is true and the blood flow is impeded. Areas of dilatation or thrombosis, and valves, if present, all influence the rate of flow in the venous system. The dependent position of the limb may reduce the flow. All veins are contractile, under the influence of heat and cold and chemical, physiological, and psychological stimuli. In addition to the ordinary influences, the venous bed is usually constricted to some unpredictable degree by the chemical irritation of the opaque medium. All these factors plus the usually unpredictable nature and location of the disease under

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investigation invite the use of a rapid serial roentgenographic technique. Figures 1 and 2 are examples of the success of the rapid film changer in demonstrating anatomic changes.

ARTERIOGRAPHY

Actual measurements of the mean velocity of blood flow in animals give values of 18 to 20 cm. per second in the normal aorta. In the carotid and femoral arteries, it is 14 to 15 cm. per second. By cardiac output measurements, it can be shown that these rates are only slightly higher in man. Changes in pressure and the distensibility of the arterial tree modify the rate of flow; but, in general, a mean flow of 20 cm. per second gives a good working rule for determination of the speed and interval of exposure necessary to visualize the peripheral arterial system. The flow in the pulmonary circulation is nearly as rapid: 2 to 3 seconds is required for opacified blood to flow from the right ventricle through the pulmonary capillaries and into the left atrium. If Diodrast is used for visualization, some unpredictable degree of arterial spasm is caused by the injection and this should be considered in interpreting the results. Because the blood moves so fast, the opacified portion may remain in the area being studied only one or two seconds. Hence, in arteriography, even more than in venography, a rapid film-changing technique is desirable. Figures 3, 4 and 5 are examples of the successful demonstration of arterial pathological conditions with the rapid film changer.

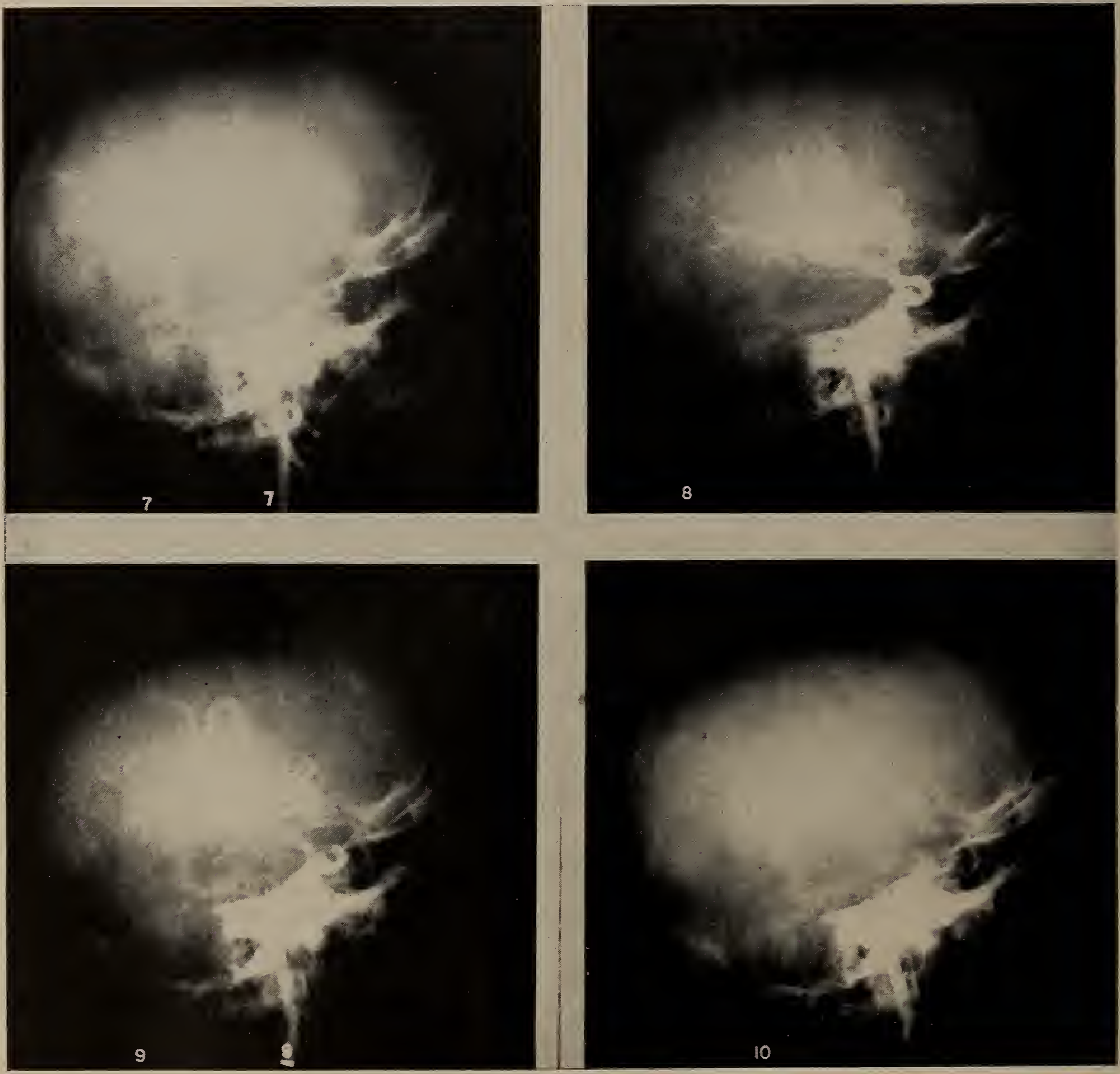

Figure 3.—Serial cerebral angiogram (interval between roentgenograms 3/4 second) on a 32-year-old woman. Ten cc. of 35 per cent Diodrast was injected into the right common carotid. A vascular tumor is demonstrated in the right upper temporal area. If rapid roentgenograms are taken, small quantities of opaque media may be used and good diagnostic visualization obtained.

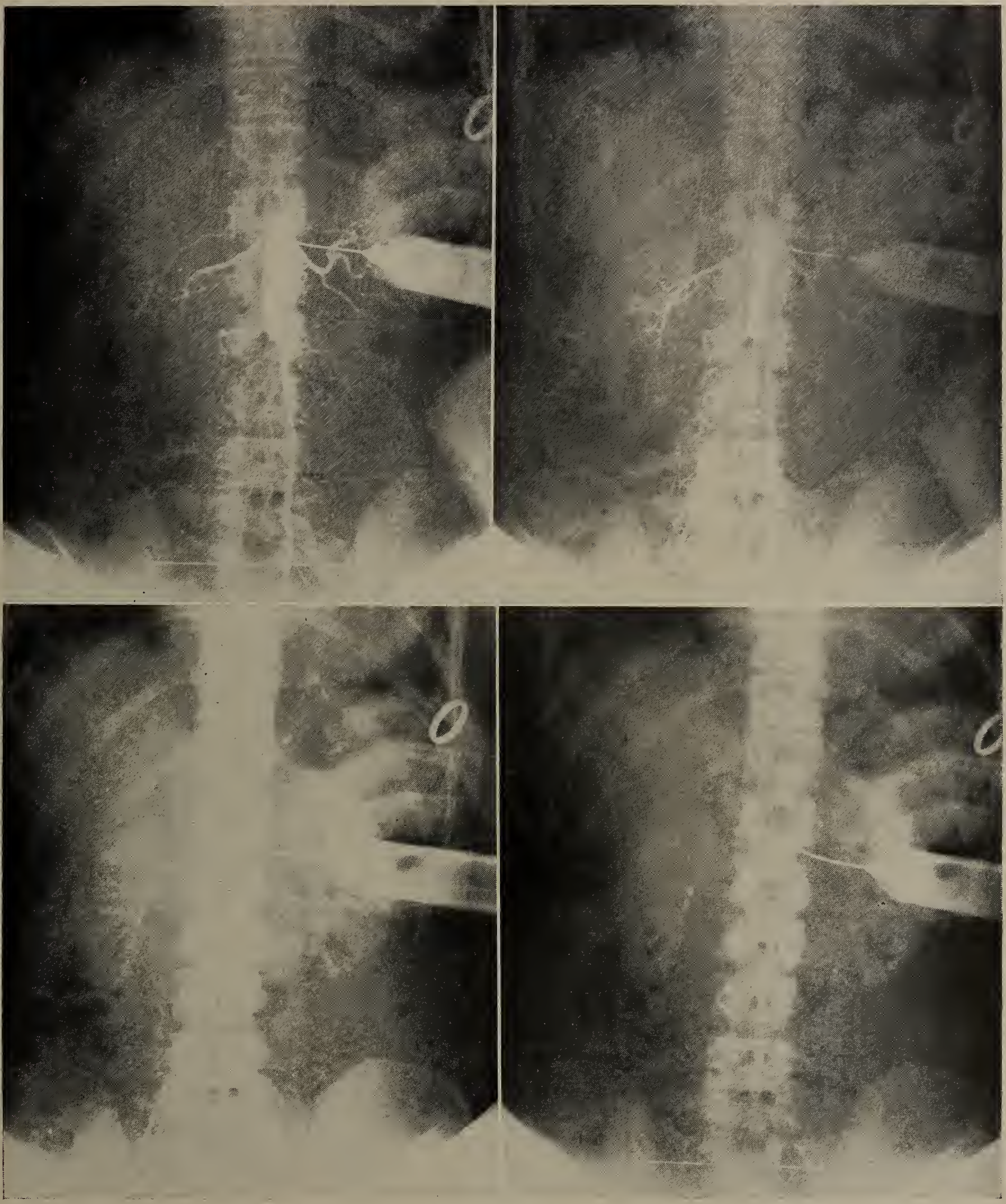

Figure 4.—Serial aortograms made by direct arterial puncture on an adult patient who had absent pulses in the lower limbs. The point of aortic obstruction is demonstrated and the collateral circulation is visualized. Note the visualization of the blood supply to the kidneys.

PERISTALSIS OF THE ESOPHAGUS

In single exposures, peristaltic systole of the esophagus may produce changes which simulate the signs of an early infiltrative lesion of the esophageal mucosa. Rapid serial radiographic studies of the esophagus may be very useful in studying these areas of questionable disease. In this manner, actual peristalsis can be recorded and followed. Esophageal tone and motility are different for the swallowing of liquids and solids. This, as well as the dynamics of the cardiac sphincter, can be recorded. All of these conditions can be seen fairly well fluoroscopically, but the rapid serial-film technique makes it possible to obtain a record of the process on large films. This makes studies of functional changes accessible to direct visualization.

MUCOSAL MOTION STUDIES

Forssell[1] showed two decades ago that two different and independent peristaltic functions are present in the stomach. One involves the wall of the stomach as a whole, producing waves at 8- to 12-second intervals which start at the cardia and move through the entire stomach to the pylorus. The other type of peristalsis involves only the mucous membrane and is caused by contractions of the muscularis mucosae. Very little is known of the intrinsic motion of the human gastric mucous membrane. Experimental observations in animals, however, have shown that these intrinsic mucosal movements are very rapid and may change the surface contour of the gastric mucosa in a fraction of a second. These changes apparently occur independent of the phase of the large circular peristaltic waves. In view of this, the author tried to visualize the outlines of the fundus of the barium-filled stomach (with the patient holding his breath and lying on his back) on a series of radiographs taken at one-second intervals. Close study of the outlines of the mucosal patterns obtained reveals that there is a rather swift intrinsic motion in the gastric mucosa, characterized by changes in height and width of the folds and resultant reciprocal changes in the depressions between the folds. Figure 6 shows these changes in mucosal contour.

URETEROGRAPHY

In 1904, Lucas[2] noted that the rate of the ureteral peristaltic waves varies greatly with the activity of the kidney and that the amplitude is subject to marked variations. Trattner[3] continued these studies by use of the "hydrophoragraph" (water-wave re-

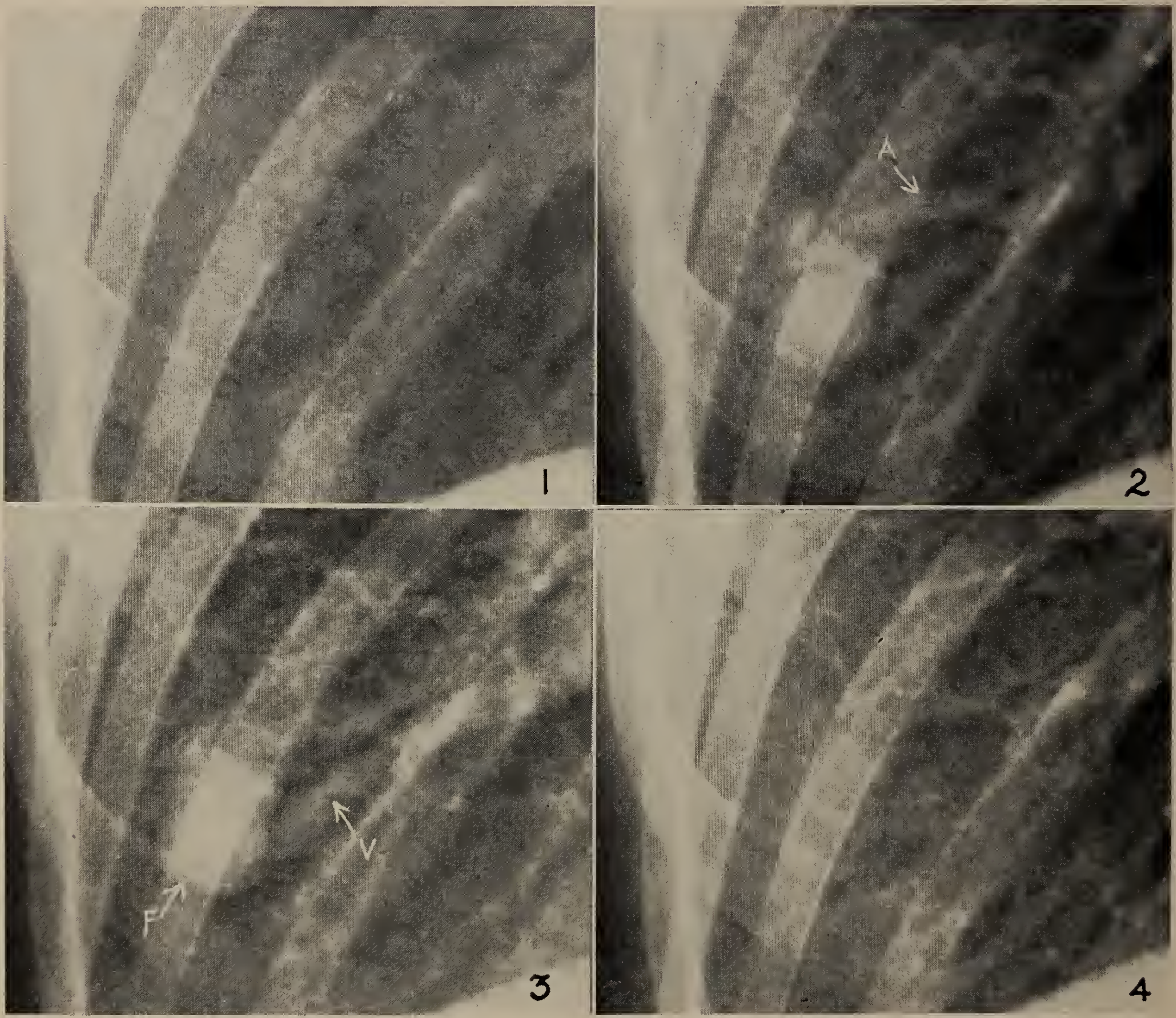

Figure 5.—Four serial radiographs of a small density in right lower lung (taken at 1/2 second intervals) after injection of 70 per cent Diodrast into the cubital vein. The mass is seen to be an arteriovenous fistula (F) of the lung with demonstration in No. 2 of the opacified artery (A) and subsequently in No. 3 of the vein (V). The need for rapid film changing technique is well demonstrated in this series, as it can be seen that the pathology was only demonstrated for a possible maximum period of 1½ seconds.

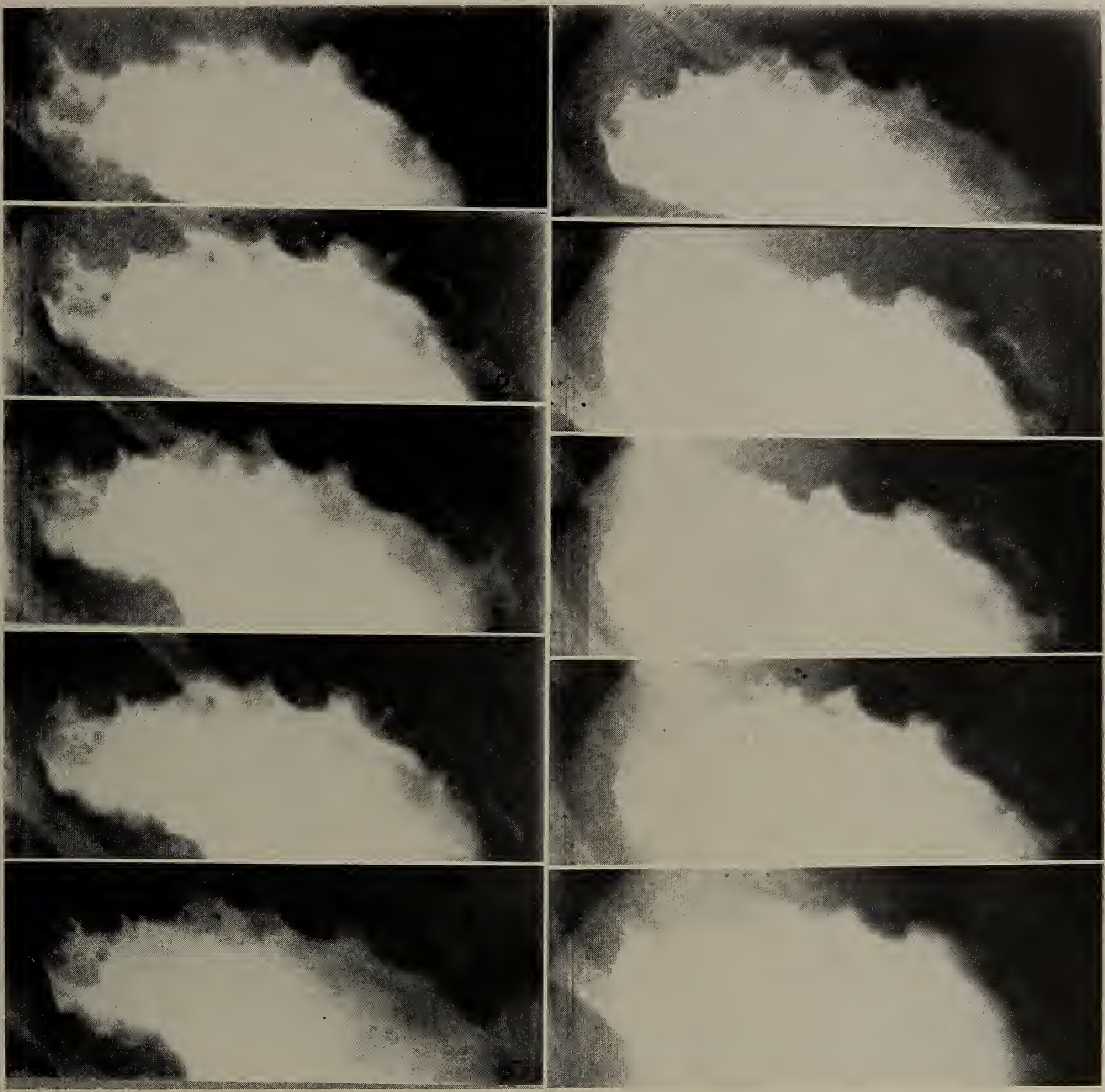

Figure 6.—Serial roentgenographs (taken at 1 second intervals) of the fundus of a barium filled stomach, taken with the patient supine and holding his breath. The fundus was studied because of the absence of circular peristaltic waves. Note the changes in contour of the mucosal pattern caused by the muscularis mucosae.

corder). He observed that ureteral peristalsis consists of (1) a longitudinal contraction which shortens the ureter and narrows but does not obliterate the lumen, and (2) a circular contraction which momentarily obliterates the lumen in successive segments of the ureter as the wave advances. Ureteral peristalsis may be in the reverse direction also. A forward peristaltic systole may begin in the middle or distal third of the ureter. This is then frequently followed by forward peristalsis of the entire ureter. Trattner used radiographs in his investigations, but could not take them at sufficiently rapid rate to visualize the motion directly, and was forced to depend upon indirect methods. The rapid serial-film technique offers a new and relatively simple method of studying the hydrodynamics of the urinary tract. It also has clinical value. In the case illustrated (Figure 7) surgical treatment was decided against after rapid radiography demonstrated peristalsis in calices and ureters.

The examples shown are chosen from a number of successful studies with the rapid film changer to demonstrate some of the varied conditions in which its use may contribute to the clarification of the diagnosis of disease or to the study of pathological and physiological movements. It is the hope of the author that this work may stimulate further investigation by rapid film studies.

Grateful acknowledgment is made to Dr. Frank L. A. Gerbode, Dr. C. E. Grayson, Dr. Evelyn Siris, Dr. Merrill Sisson,

and Dr. Frank Windholz for help and suggestions in this work.

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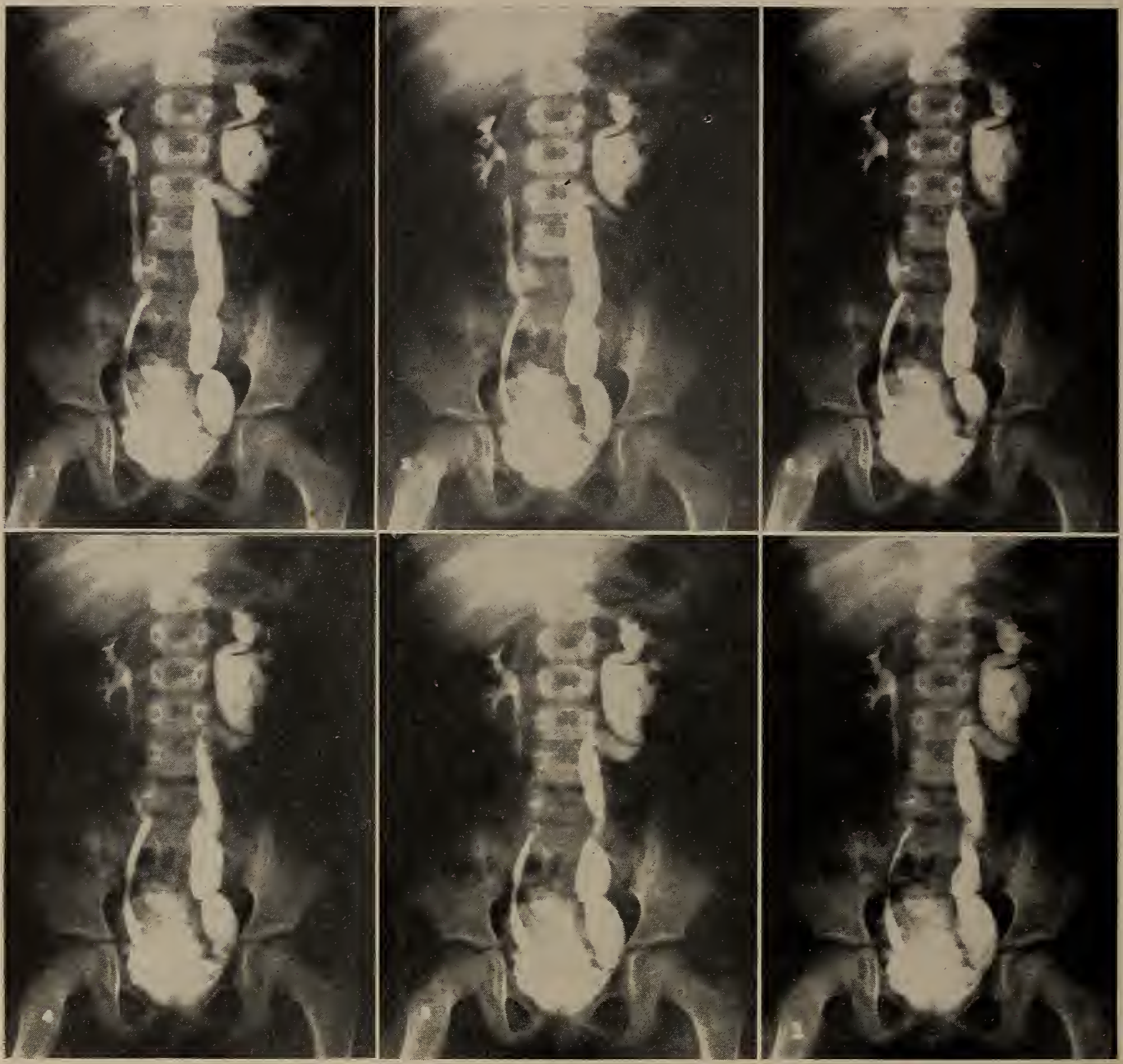

Figure 7.—Serial radiographs of the urinary tract of a 5-year-old girl taken with the rapid film-changing technique. Films were taken at 3/4 second intervals. Retrograde urography shows hydronephrosis and hydro-ureter on the left, moderate widening of the lower half of the right ureter, and deformity of the bladder. The rapid changes of peristaltic systole and diastole can be recognized on the radiographs. It is evident that peristaltic waves are present on the diseased (left) side as well as on the more normal (right) side. It is of interest that in addition to circular contractions, longitudinal contractions can also be observed; this is most evident in the lower segment of the left ureter.

Radiation Therapy of Ringworm of the Scalp

M. E. Mottram, M.D., and Harold A. Hill, M.D., *San Francisco*

SUMMARY

A recent epidemic of tinea capitis in children has revived a considerable interest in the methods of treatment of this disease.

The most efficacious form of therapy for M. audouini infections is roentgen epilation.

The various methods of x-ray treatment are briefly presented and compared. A modification of the four-point technique is shown to offer a simple yet safe method of curing ringworm of the scalp. Results with this method compare favorably with the best of those reported by the use of other methods.

Cure was effected by this method in all of a group of 125 cases.

Ringworm of the scalp in the last few years has again reached epidemic proportions in this country.[7, 8, 14] It is most efficiently treated by epilation of the scalp.[8] It is our purpose to present a simple and safe method of epilation by x-ray which we have used successfully in over 125 cases.

NATURE OF THE DISEASE

Ringworm of the scalp is also known as tinea capitis or tinea tonsurans. The majority of infections are due to the fungus M. audouini and smaller numbers to M. lanosum or to trichophyton.

Diagnosis is usually made by clinical and microscopic examination and use of the Wood's light. M. audouini is separated from the other organisms by means of culture. Tinea capitis is a disease of childhood and more frequently occurs in boys. It tends to persist until puberty[15] unless cured by topical or x-ray therapy.

The latest epidemic started in this country in the East in 1943. Prior to 1944 the incidence in San Francisco was small. The reported cases in San Francisco school children suddenly increased from 268 in 1944 to 613 in 1945 and 616 in 1946. Since then the incidence has diminished sharply.

CONTROL

Unless a vigorous program of control is instituted, epidemics of ringworm disease tend to continue unabated and to spread rapidly. In San Francisco ringworm of the scalp is not a quarantinable disease. A child with the disease is readmitted to school upon presentation of a statement from a physician that he is receiving treatment.[2]

Many public health measures for control of the disease have been advocated, such as detection of cases, isolation of infected children and organization of sanitary regimes in barber shops, schools and theaters.[7, 14] Treatment of the infected child is either by a physician in private practice or at specially organized treatment centers. The main type of treatment has been topical medication. Salicylanilide ointment has been found to be the most effective medicinal agent. However, a large number of treatments (50 to 100) are usually necessary in order to obtain a cure, and a relatively large percentage of M. audouini infections do not respond to topical medication.

Manual and chemical epilation have been used in the treatment of tinea capitis with varying degrees of success. These procedures are apt to be painful and slow and are associated with the dangers of local infection or permanent alopecia. Epilation by means of x-ray treatment has proven to be not only the best and the least dangerous method of epilation, but also the most efficacious in treatment of ringworm of the scalp.

X-RAY TREATMENT

It is difficult to understand why tinea capitis is still a therapeutic problem today when such an effective method of treatment as radiation epilation is available to the medical profession. X-ray treatment has been all too infrequently used because of the fears engendered by the damaging effects of irradiation which sometimes occurred in the period shortly after Roentgen's discovery, and prior to the introduction of a reliable method of dosage measurement.

Calibration of equipment and measurement of the dosage by means of ionization are no longer a problem. However, there are in general use today several methods of x-ray epilation. These revolve around (1) the number of fields or centering points, (2) the size of the fields, and (3) the doses per field.

In an attempt to obtain a uniform distribution of dosage over the entire scalp several overlapping fields are used—usually from three to five.[1, 4, 5, 6, 8, 10, 13, 15] However, in no method is there perfect uniformity of the dosage. In the Kienbock-Adamson technique where five fields are used, there are two areas on each side of the scalp where three fields overlap and in which the accrued dosage may be two to two and a half times that received at the

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centering points.[3, 11] In contradistinction to the five-point method, Schreus and Proppe[3] have shown that the four-point technique has only a single and smaller area of triple overlap on each side and these areas receive a smaller accrued dosage than is given by the Kienbock-Adamson method. Even though some regions receive considerably greater dosage than others, permanent epilation has been reported in a very few instances where the Kienbock-Adamson technique is used and then only in the triple overlap areas; it has never been reported with use of the four-point method.

AUTHOR'S METHOD

The following is an account of our procedure in handling cases of ringworm of the scalp.

We believe that only cases refractory to topical medication should be treated with x-rays.

Children approaching puberty should not be treated. Rothman[12] has found that a certain component of adult human hair is five times as effective as that found in children's hair in inhibiting the growth of M. audouini *in vitro.* This is believed to be the explanation for the spontaneous cures which occur at about 15 years of age (puberty) and why tinea capitis is rarely seen in adults.

Other contraindications to irradiation are severe dermatitis due to infection or chemotherapeutic agents, erythema secondary to ultraviolet rays and previous unsuccessful or successful epilation of the scalp by x-rays.

It is our preference that the patient have the hair clipped, although this is not necessary. If there are heavy crusts on the scalp, these should be soaked off before therapy. A stocking cap should be worn until epilation occurs to collect the infected hairs and diminish the chance of contagion.

The child should be accompanied by a parent in order that his cooperation may be secured more readily. We have seldom found it necessary to use restraint. Occasionally we have had the parent sit or lie down on the table beside the patient during the first treatment to keep him still.

The apparatus we use is a shockproof x-ray therapy tube which has been calibrated with a Victoreen dosimeter. At 140 KV and 25 milliamperes it delivers 100 r per minute at 40 cm. F.S.D. The HVL is 4 mm. Al or 0.2 mm. Cu.

The four fields are set up as follows:

1. Right lateral: The patient lies on his back with the head turned 90 degrees to the left. The centering point is midway between the frontal hairline and the occipital protuberance. This point usually falls just above the ear (Diagram 1).

A protective lead shield is used to cover the face.

2. Left lateral: similar to centering for right lateral (Diagram 1).

3. Occipital: The patient lies on his abdomen with a sandbag under the forehead and the neck flexed. The centering point is in the midline and is 8 cm. above the posterior hairline (Diagram 2).

4. Frontal: The patient is placed in a well-supported sitting position. The centering point is in the midline and 8 cm. from the frontal hairline. Small lead shields are placed over the eyebrows (Diagram 3).

The central beam is always directed at right angles to the central point of the field being treated.

The treatment factors are 140 KVP, 25 ma, 40 cm. FSD, 20 cm. circle field size, no added filter, 300 r in air per field, and only one field treated per day. The course of therapy is completed within a week.

We treat the four fields in the sequence given above, finding that in this manner it is easier to elicit the child's cooperation so that he will hold relatively still.

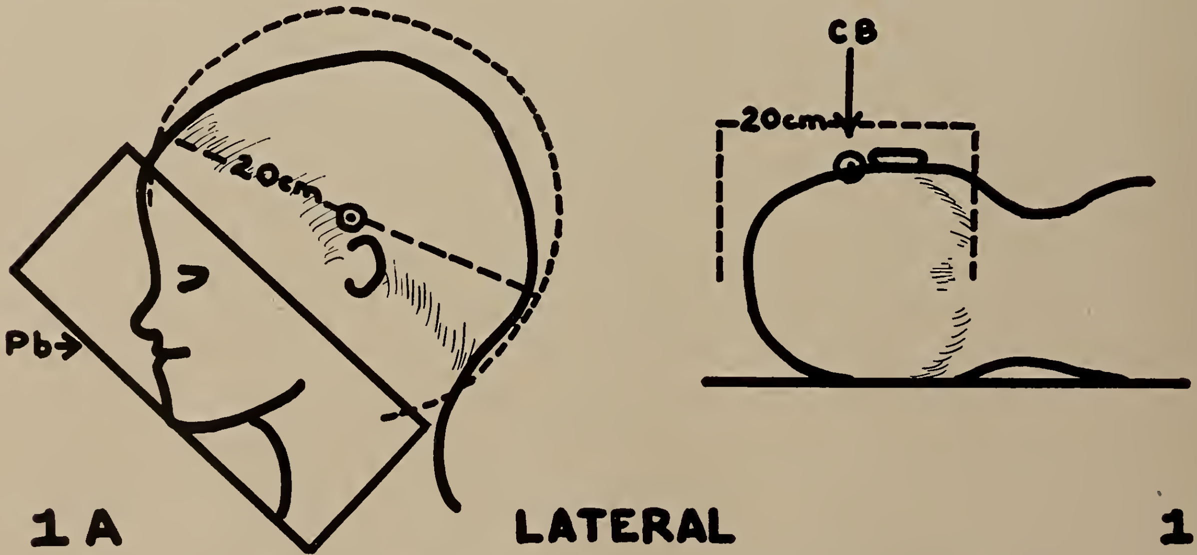

Diagram 1, A and B.—Lateral: Position of the head and direction of the central beam for irradiation of the lateral field(s).

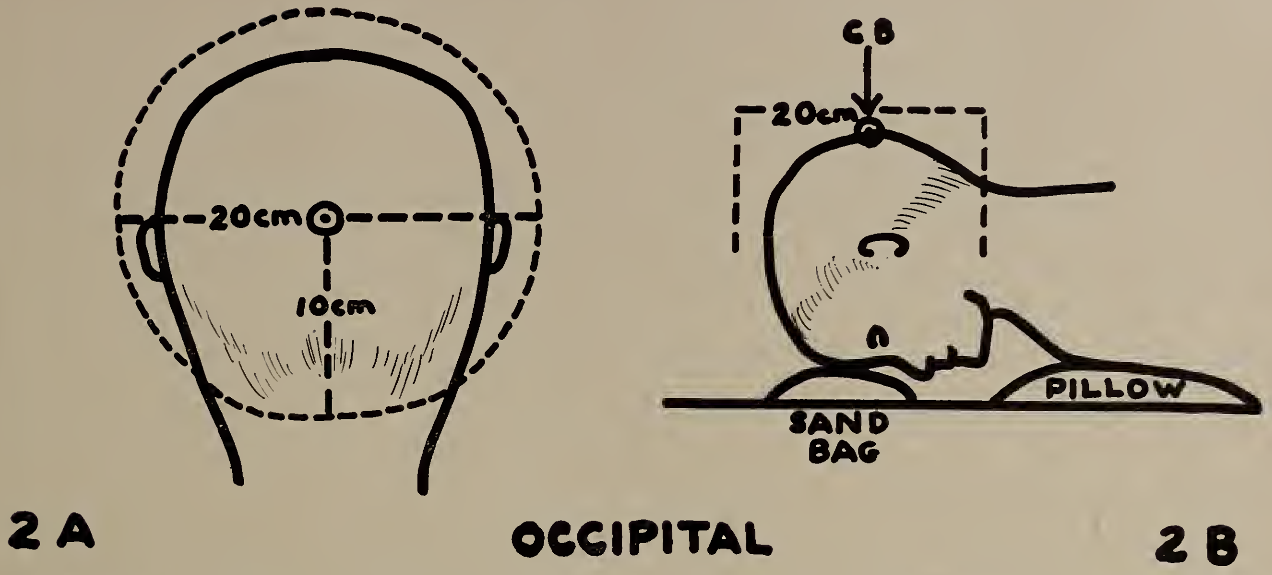

Diagram 2, A and B.—Occipital: Position of the head and direction of the central beam for irradiation of the occipital field.

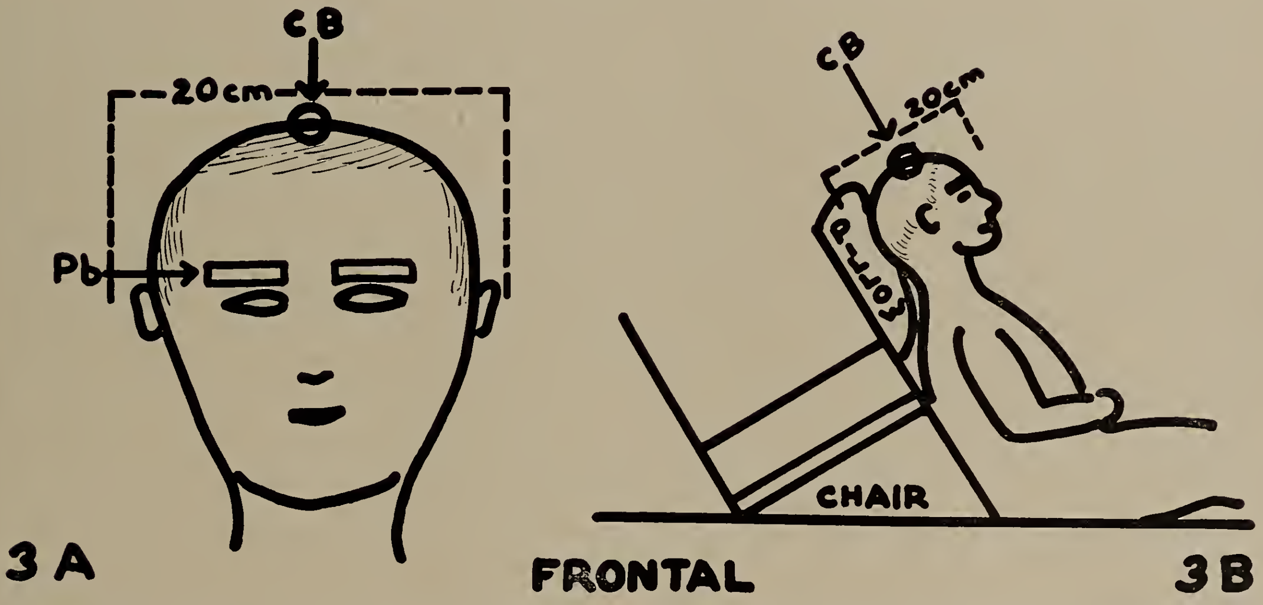

Diagram 3, A and B.—Frontal: Position of the head and direction of the central beam for irradiation of the frontal field.

RESULTS OF TREATMENT

The defluvium occurs between the 18th and 26th days following the completion of the x-ray series, and regrowth occurs in from two to four months. Cure of the ringworm is assured if epilation is complete. With incomplete epilation a cure will only be obtained if the few remaining patches are mechanically epilated and fungicidal ointment used until there are repeated negative reactions to Wood's light tests.

In our series of over 125 cases, all of which were treated by the four-point method, cures were obtained in all patients. About 40 per cent of these patients had some residual hair which was removed by their own physicians. This hair was found either in spotty areas or in frontal or occipital fringes. We do not believe it is advisable to further irradiate the scalp to remove the residual hair.

Two patients had faint erythema following treatment, one a child who originally had a diffuse inflammatory reaction. Several patients had a vague "unwell" feeling, but only three (2.4 per cent) reported troublesome nausea or vomiting during the course of x-ray therapy. Shanks,[15] who also uses the four-field technique, reports a 40 per cent incidence of vomiting after irradiation. This disparity illustrates one of the advantages of not giving all the treatments on one day. Others have reported elevation of temperature and glandular swelling; these did not occur in our series.

The majority of mothers reported no change in color or texture of the hair, but in five instances the new hair was thought to be darker, in three instances lighter, and in three others the hair came back curly.

We anticipate no damaging effects to the brain or pituitary with our technique, inasmuch as we have seen none and none has been reported to date from the many thousands of cases similarly epilated with x-rays.

We believe that our modification of the four-point method offers the following advantages:

1. Preciseness and completeness of description of technique. In practically all of the techniques which have been described to date, there is either a vagueness of the stated factors, omission of one or more factors, or discrepancies in the presentation of the method.
2. Simplicity of application. Regardless of the size or shape of the head, or the age of the patient, the same technical factors are used in all instances. No special frames or other methods of marking the scalp are required. Ordinary care in centering the patient and the field of irradiation is all that is required, instead of detailed linear and angular measurements as in the Kienbock-Adamson technique.
3. Saving of time. There is a saving of the physician's time by the use of four rather than five fields, and positioning is more rapid.
4. Safety. The four-point technique is just as effective as the five- or three-point methods in epilating the scalp and is a safer method than either of these because there is less overlapping of the treatment fields. Furthermore, we have been successful in the use of a relatively small exposure, 300 r in air per field, as also used by MacKee et al., and Molesworth and Riddle, in contradistinction to the 400 r per field advocated by Shanks, and by Schreus and Proppe. The small dosage, plus the fact that we treat but one field a day, probably accounts for the reduced percentage of systemic reactions in our series.

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Discussion by R. R. NEWELL, M.D., *San Francisco*

In general one should be slow to use x-ray in non-malignant conditions, for it is hard to be sure that no bad effects will follow later, even many years later. However, I do believe that x-ray epilation for intractable ringworm of the scalp is proper treatment, if done right and only once. The five-point technique does give the most even irradiation, but only if the distance is about equal to the diameter of the head (I use 15 cm.), and if the four non-central fields are centered at the edge of the hair. The temptation to center well upon to the hairy portion must be resisted. If the quality of the ray is soft enough, all areas can be treated at one sitting without producing roentgen sickness. Proper dosage (300 r to each field at the quality Drs. Hill and Mottram use) will always leave a few hairs or quite a number. Really complete epilation would make me suspect a dose twice as large as necessary or permissible. Considerable patches of residual hair do not necessarily preclude success in eradicating the disease. Under no circumstances should the scalp be irradiated again.

Discussion by H. V. ALLINGTON, M.D., *Oakland*

Doctors Hill and Mottram have done a worthwhile job in reviewing the treatment of scalp fungus infection. The time lost from school on its account and the discomfort, embarrassment and expense attendant to it make it an important disease of childhood.

The basic reason for the difficulty in clearing scalp fungus infection is the invasion of the shaft of hair by the fungus and its growth down into the follicle. Thus the infecting organism is protected from and inaccessible to topical medication. Fungicides applied locally probably accomplish little beyond controlling superficial infection and preventing spread.

Cure depends upon the involved follicles being emptied of their infected hairs. Large numbers of these are shed spontaneously and others are loosened and removed in applying medication and shampooing. Reasonably prompt loss of the infected hairs can be obtained in many cases by removal with tweezers, adhesive tape, and/or depilatory wax. Usually the greater the individual's inflammatory reaction to the fungus, the looser are the infected hairs. Thus in a kerion in which intense local allergy develops each involved follicle becomes the center of a tiny furuncle-like pustule from which the offending shaft is sloughed spontaneously.

Other conditions which favor success in treatment with local medication and mechanical epilation are: (1) relatively limited involvement; (2) ability and willingness of patient and family to cooperate; (3) availability of a Wood's light under which infected hairs fluoresce and are more easily identified.

In other cases little inflammatory reaction is present and the infected hairs may not epilate easily. There may be extensive involvement of the scalp. It may promptly be determined that the child or parents are not going to provide the very necessary cooperation required for success with local medication and mechanical epilation. It is in these cases that epilation by x-rays is most valuable and should be used promptly. In our office we use x-rays in a little over one-third of our cases.

We use the Kienbock-Adamson five-exposure technique. We have celluloid templates with which we mark the five positions quickly and easily. We use a Coolidge tube surrounded by a shockproof shell but with a wide port and no filtration. Our factors are 80 K.V., 5 ma., and an 8-inch distance. We give 300 r measured in air to each of the five areas at one sitting. Epilation is not always complete with this technique and dosage. There is often some hair left on the occiput at the nape of the neck and at times elsewhere. It is sufficiently complete that usually a minimal amount of manual epilation or none at all is required to complete the cure. We have had no case in which we have had to re-epilate with x-rays, none in which a satisfactory regrowth of hair did not occur, and we have had no trouble with general reaction following treatment. It is our practice to use local fungicidal medication following fall of the hair and during regrowth to care for any superficial infection which might be present and to guard against recurrence.

The satisfactory results which Drs. Hill and Mottram obtain with a technique considerably different from ours show again that there is more than one way to skin a cat.

I should like to emphasize that x-ray treatment is a simple, safe and extremely valuable method of securing the fall of hair necessary in the cure of scalp fungus infection. It is available and should be used without hesitation whenever indicated.

* * *

Report of an Outbreak of Ringworm of the Scalp Due to M. Audouini

Roy O. Gilbert, M.D.,* *Los Angeles*

SUMMARY

Experience in Los Angeles County with an outbreak of ringworm of the scalp caused by M. audouini, and a review of the literature have led to the following conclusions:

Diagnosis: *The Wood's lamp is an indispensable piece of equipment in case finding. While M. audouini infection is often characteristic in appearance, there are frequent variations. Culturing on Sabouraud's medium (glucose-agar) is a requirement for positive diagnosis. Most surveys show an infection ratio of six or seven boys to one girl.*

Treatment: *X-ray epilation provides the best prospect for cure in the shortest time. Manual epilation can be employed but is less efficient and more disagreeable. Shaving the scalp every seven to ten days is helpful in preventing the spread of the infection but is not a satisfactory substitute for epilation. The most effective topical application is an ointment containing 5 per cent salicylanilide in carbowax 1500. All treatment should be conducted under trained supervision for constancy and thoroughness. Hormone therapy is in general to be discouraged.*

Control: *With proper supervision of treatment and adequate protective covering of the scalp, there need be no loss of school time after treatment has been instituted. Enlistment of the barbers of the community in refusing to serve clients with obviously infected scalps, and properly sterilizing instruments is important. Cutting instruments can be satisfactorily sterilized in petroleum oil at 100° C. without detriment to the instruments. Complete discipline must be maintained on school grounds with regard to exchange of headgear between children.*

RINGWORM of the scalp has been discussed quite comprehensively in the medical and public health literature during the past few years and has been reported from representative population centers from coast to coast. The epidemic status of the disease began on the East Coast about 1940 and promptly and progressively pursued a westward course until it eventually was recognized to have arrived in Los Angeles County in 1946.

Just how many cases of ringworm of the scalp due to M. audouini it takes to make an epidemic may be a debatable point, but the appearance of a single case should be sufficient to incite at least a mild state of alarm among those members of the community concerned with the control of communicable diseases. It requires no exhaustive search of the literature for one to be impressed with the persistent and resistant qualities of M. audouini and to be forewarned that it gets into the hair administratively as well as pathologically.

For a symptomless affliction of the childhood population this disease certainly is capable of a most diabolical upset of the adult equanimity. The child with the moth-eaten appearance to his scalp is somewhat of an assault to the esthetic senses and, in spite of the completely negative mortality rate and the absence of physical suffering, this condition is prone to arouse a most agonizing mental reaction. Parents are the first to register alarm and this is rapidly transmitted to school authorities who in turn enmesh public health workers in spreading shadows of public concern. In the meantime, the child, who is the primary victim and has been pretty oblivious to his affliction, begins to register concern over the prospect of becoming bald at a very tender age; and, if he is of school age, this develops into a matter of real concern, particularly among girls.

But the ultimate upset occurs when the nature and duration of treatment are explained. At this point rebellion, hysteria, economics, and juvenile delinquency dominate the scene. To subject the victim to complete epilation of the scalp is a prospect that is strenuously resisted by both parent and child. And yet, total epilation is a procedure that is classified as a must.

Manual epilation, although it offers the advantage of economy, seems to border on the cruel and barbaric, and rarely is performed with satisfactory thoroughness. X-ray epilation offers the most satisfactory and efficient epilating procedure when applied with an approved technique, but offers the disadvantage of expense, insufficient technical resources to supply the demand, a small but uncomfortable percentage of failures, and inadaptability to the restless, uncooperative, or frightened child. It has often been observed that x-ray epilation needs to be supplemented by manual epilation. This method is widely regarded as the method of choice, and some observers insist that an epidemic cannot be brought under control without it. A compromise

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procedure consists of shaving the scalp every seven to ten days. This, however, does not accomplish the emptying of the hair follicle that is accomplished by x-ray.

All epilating procedures require a follow-up with topical application of an approved fungicidal ointment used with thoroughness and constancy over a minimum period of several months. The ointments that have achieved the best record of success contain 5 per cent salicylanilide in carbowax 1500, or copper undecylenate. One such preparation is known proprietarily as Salinidol. It is pretty generally acknowledged that the treatment of M. audouini infection deserves the services of a trained dermatologist.

Wilson and Plunkett[18] reported the presence of the audouini type of tinea capitis in the Los Angeles area early in 1947 and warned of the imminence of an outbreak. It was about at this time that clinic services in the San Antonio district of the Los Angeles County Health Department began noticing a type of ringworm of the scalp that was exceedingly resistant to ordinary methods of treatment. We arranged for the examination of a number of cases by microscopic and cultural methods. With the positive diagnosis that ensued, immediate steps were taken to secure ultraviolet ray equipment with the Wood's filter and enough cases were found in the Bell Gardens area to impel a survey of the elementary school population of that community. A dermatologist was employed to conduct the survey and was assisted by public health nurses. During the fall of 1947, out of 2,829 scalps examined in five elementary schools with the Wood's light, 97 or 3.4 per cent fluoresced. Cultures free from contamination were obtained in 87 of these cases, of which 84 (96 per cent) were M. audouini and 3 (4 per cent) were M. lanosum. Only three cases were found in the junior high school. Experience in this survey revealed that nurses could very satisfactorily do the screening operation with the Wood's lamp and conserve the time and the effort of the dermatologist for the final Wood's lamp observation and the culturing operation.

Owing to the requirement of the Administrative Code of California under Title 5 on Education, that no pupil, while infected with any contagious or infectious disease, shall be allowed to remain in any of the public schools, it became necessary to exclude these children from school. Arrangements were made with the local school authorities for home teaching classes and the patients were referred to private medical practice for treatment. The relatively low economic level of the community resulted in very few cases coming under the supervision of dermatologists. Although an offer was made to perform x-ray epilation at reduced rate on patients with resistant cases, the limited resources of White Memorial Hospital where the treatment was to be given and the financial limitations of the patients combined to greatly limit the use of this procedure. As a consequence, the great majority of these cases were treated by topical applications on the shaven head. With the patients excluded from school, the supervision of treatment could not be satisfactorily conducted, and great reliance had to be placed on cooperation by the parents. Each patient was urged to come to the health center every two weeks for examination and inspection with the Wood's light.

A review early in January, 1948, of the 97 cases diagnosed in the survey revealed:

Returned to school as cured		18
Still excluded from school		62
Moved from the area and unavailable for interview		17
Cases treated under health department observation with Salinidol		39
Cured within 3 months		9
Still under treatment		30
Under treatment less than 2 months	15	
Under treatment 2 to 4 months	15	
Discovered subsequent to survey		17
Preschool cases secondary to survey cases		8

Of the 62 still excluded from school:

3 had been out less than 1 month
2 had been out between 1 and 2 months
23 had been out between 2 and 3 months
34 had been out between 3 and 4 months

Of the 18 returned to school:

6 were out less than 1 month
5 were out 1 to 2 months
6 were out 2 to 3 months
1 was out 3 to 4 months

Summary of absence from school:

80 per cent were out more than 2 months
44 per cent were out more than 3 months

This summary is of no more significance than to emphasize an already well-established observation that treatment of M. audouini infection by topical application is a time-consuming procedure extending over a period of many months.

Swartz and Peck[15] and their co-workers in the epidemic at Hagerstown, Maryland, have reported in some detail their complete success in eradication of the disease in that town in one year using topical applications without recourse to epilation by x-ray. This was accomplished without excluding children from school and by setting up a treatment center operated by trained personnel at each of the city's seven schools to ensure proper daily treatment.

It has been generally observed from the experience in other areas that x-ray epilation is the most efficient method from the standpoint of time and certainty of cure. There has been a sufficient experience to ensure its safety when the five-point technique of Kienböck and Adamson[1] is used. Cipollaro states that one radiologist can treat about 3,000 patients in one year.[3]

In view of the fact that spread of the infection is attributed to the scattering of infected hairs, it would seem that there should be no epidemiological necessity for excluding from school any patient in whom the disease has been diagnosed and brought under proper treatment. By permitting school attendance after treatment has been instituted better control can be exercised over the constancy and effectiveness of the treatment, the loss of school time is brought to a minimum and, to that extent at least, juvenile delinquency is prevented. With a tight-fitting stocking cap to cover the epilated and ointment-covered scalp, and a headgear of aviator type for the boys and a scarf or turban for the girls, the communicability has been brought to the vanishing point as long as these precautions are observed.

Our survey of the grade school population did not progress as rapidly as we would have liked, because of the slowness with which the Wood's light has become available. The variation in cycles of the electrical current in different communities also was an obstacle. Equipment designed for use with 60-cycle electricity is not usable with 50-cycle electricity, and vice versa. When we surveyed the East Los Angeles area where the income level is relatively low and the foreign element is high, we expected to find a considerable number of cases. We were, therefore, somewhat surprised when only a single case was discovered in more than 2,000 examinations, although this community is only five miles distant from Bell Gardens where a moderately heavy infestation was found. In the Alhambra-El Monte area, which lies an additional five to ten miles away from the Bell Gardens area in the same direction as East Los Angeles, we examined 5,185 pupils in six schools. Here we discovered only two cases of audouini infection and seven cases of lanosum. Proceeding with our survey on the same radial line, we examined 2,242 pupils in eight schools of the foothill region of Monrovia and Duarte about 15 to 20 miles from Bell Gardens. Here we have found 21 cases positive to Wood's lamp examination, of which 16 were proved to be due to M. audouini. Two preschool children were found with the infection in the families of the infected school children. Up to the present time we have examined 12,493 scalps with a yield of 164 cases of M. audouini infection confirmed by culture, or 1.3 per cent. The Bell Gardens area accounted for 63 per cent of the yield.

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Discussion by L. S. GOERKE, M.D., *Los Angeles*

In the spring of 1947 the Los Angeles City Health Department, using Wood's lamps, examined 1,381 children attending five parochial schools. From this survey, 14 children with suspicious scalp lesions or fluorescent hairs were referred to our central clinic for examination by the dermatologist, and cultures were prepared for microscopic diagnosis by the mycologist. Ten (0.7 per cent) of the children originally examined were found to have tinea capitis, with M. audouini confirmed in eight (0.6 per cent). One year later, these same schools were examined by the same nursing personnel with the following results:

School	1947		1948		
	Number Examined	Audouini Cases	Number Examined	Audouini Old Cases	Audouini New Cases
Cathedral	460	0	478	0	1
Queen of Angels	282	0	300	0	0
St. Lawrence	224	5	268	2	0
St. Patrick's	135	3	193	1	1
St. Joseph's	280	0	255	0	0
Total	1,381	8	1,494	3	2

The patients were permitted to return to the parochial schools, provided they remained under treatment of a dermatologist or one of our treatment clinics and followed the recommendations and instructions of the clinics. It is interesting to note that there were only two new cases out of a school population of 1,494 children examined.

At the end of the first school survey a three-hour seminar on tinea capitis was conducted by several public health dermatologists at our Southeast Clinic, May 22, 1947, for public health personnel and private physicians. Cases of various types of tinea capitis were demonstrated by several commercial types of Wood's lamps, together with cultures and microscopic exhibits. It was shown that there is a decided difference in fluorescence by the various Wood's lights, with one type of equipment much more efficient. At present we are using several Keese Engineering Wood's lamps, which has been our choice up to this point, although other companies have been improving their filters. To provide our district health officers with some type of black light, while procuring more efficient equipment, purple X (perflex) bulbs, costing $1.25, were used in goose neck lamps with fine wire mesh protectors. With these bulbs we picked up a few cases of tinea capitis, but probably missed many more. The first of a special floor model Wood's lamp which eliminates most of the inconveniences of lamps previously used is being tried in one of our clinics.

As Dr. Gilbert has stated, the Wood's lamp is indispensable in case finding. It is also of value in following the progress of therapy and in evaluating cures. We have learned the necessity of having an expert, preferably a mycologist, examine the cultures. The final diagnosis is sometimes delayed three weeks for a good culture to grow.

One of our clinic teams—dermatologist, laboratory technician, nurse and clerk—conducted demonstrations for school physicians and nurses. Since then continuous surveys have been in progress in the public schools and these have resulted in the discovery of 115 cases.

One hundred eighty-five cases were diagnosed in the Los Angeles City Health Department clinics during the first year's experience with tinea capitis; 25 cases were in preschool children (child health clinics, outside referrals, family contacts); 24 were in children attending parochial schools, and 136 were in pupils at public schools.

Most of the cases were found in the Central, Watts, and Southeast areas, which are high population density, low income areas. This is where we have concentrated the case finding program. Other areas are involved, but at the present time the extent is undetermined.

The age of the patients ranged from 2 to 12 years, with males predominating five to one. Duration of the infection ranges from two weeks to one year. Epidemiological investigation as to barber shops, theatres and churches has revealed no common source of infection.

As Dr. Gilbert stated, x-ray epilation provides the best prospect for cure in the shortest time. However, this service is difficult to obtain. The Los Angeles Dermatological Society appointed a committee to investigate the subject and to meet with the radiological section of the County Medical Association. Extreme caution because of extreme sensitivity to the medicolegal aspect was very evident. It was decided after considerable discussion that the procedure was safe and that if a precedent were established legal hazards would disappear and x-ray clinics to meet the need would follow. White Memorial Hospital has set the precedent, but the free, part-pay x-ray epilation clinics or services, where the greatest need exists, have not followed. Therefore, the health department has the responsibility of operating daily clinics, not only for diagnosis, but for treatment.

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Factors Influencing the Choice of Hearing Aids

William T. Duggan, M.D., *San Francisco*

SUMMARY

Recently the problems of the hard-of-hearing have been receiving more attention. Laboratories for proper treatment and diagnosis are being developed. The Army and Navy rehabilitation centers have made great strides in the advancement of the problems of selecting hearing aids and training in their use. Hearing aids have improved greatly since the advent of the midget vacuum tube. Newer and better models are continually being produced. Fitting of aids to an audiogram is not practical as yet. Bone conduction oscillators are inefficient and seldom indicated. The conduction type of hearing impairment does not usually present much of a problem as far as selection of an aid is concerned.

Anyone who has difficulty in hearing ordinary conversation should think seriously of wearing an aid.

A WAVE of enthusiasm is spreading throughout this country regarding the diagnosis and treatment of impaired hearing and allied problems. Some of the reasons are the government-sponsored research on the subject in conjunction with the Army and Navy rehabilitation projects, the recent improvements in hearing aids, and the wide publicity given the fenestration operation. It is hoped that this interest will continue so that otologists will have a more thorough understanding of the subject. Then, and then only, shall we be in a position to treat, or direct into the proper channels, those with hearing difficulties.

Generally speaking, we are all familiar with the diagnosis of the various types of hearing impairments. We also know how to treat those whose difficulty is amenable to medical or surgical procedures. Unfortunately, so far a large percentage of cases do not respond to any known treatment. For the majority of persons in this group the only salvation is the hearing aid. These are the individuals who need more help from otologists than they are getting. At least we should be well enough informed that we may intelligently advise them regarding the proper choice of an aid.

There are two schools of thought regarding the choice of aids. At one extreme are those who believe that individual fitting is unnecessary, that an instrument of proper construction will meet all usual needs. At the other extreme is the belief that each case calls for an especially chosen instrument. Judged on the basis of results, the latter belief certainly overwhelms the former. A resumé of what has been accomplished by the Army and Navy programs, along with the Psychoacoustic Laboratory at Harvard and the Central Institute of the Deaf at St. Louis, substantiates the conclusion that careful consideration of numerous instruments or combinations of instruments is necessary for the best results.

As a result of the highly satisfactory work that these agencies have accomplished, many new acoustic laboratories are springing up throughout the country. The purpose of these laboratories is to give the otologist a much more comprehensive and complete auditory evaluation of the individual with hearing defects and to apply proper therapeutic measures which the otologist is not equipped to render—for example, the fitting of hearing aids, instructions in the use of them, and the treatment of the psychological problems involved.

Anyone observing, at any of these institutions, patients going through the various steps for the selection of aids, could not but notice the tremendously beneficial psychological effect that is produced. Thus, not only is the most desirable instrument chosen, but also the proper mental attitude for satisfactory use is attained.

The hearing aid problem, of course, is only one of the many functions that these laboratories deal with. Lip reading and speech training, as well as research work, are being carried on in most of them. With this type of program under way, we should be in a position in the very near future to render a more encouraging service to countless thousands of hard-of-hearing persons.

Otologists fortunate enough to practice in a community where one of these laboratories is in operation and available to private patients need not worry about what to do with the individual who needs an aid or who needs an accurate evaluation of a hearing problem. In that case the physician, after completing the physical part of the otologist's examination, refers the patient to the laboratory. A brief report of his findings and recommendations accompanies the patient. No patient is accepted unless referred by an otologist or a physician acquainted with aural disease.

In 1940, a survey by Day[3] stated that 75 per cent of all hearing aids purchased were discarded. Three years later, Hughson and Thompson[4] carried on another survey and found that in those cases where the individuals were properly examined, tested, and measured by thorough speech reception tests, the number of satisfied users was increased to 80 per cent. A later survey by Thompson[5] at the Naval

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Hospital in Philadelphia showed that 94 per cent of those fitted properly with aids were continuing to use them.

Hearing aids have improved greatly since the advent of the midget vacuum tube in 1938. There is still a great deal of room for improvement in them and changes are being made continually for the better. Batteries which are much smaller and many times more efficient have been developed. The present aids were built to fit the only types of batteries then available. The newer batteries will be about one-fifth the size and will last many times longer. Instruments are also coming out with entire electronic circuits "printed" in electrically conductive "ink" on small cards. This will cut down even more on size and reduce the amount of labor necessary for assembling. Vacuum tubes have been made about the size of a pea, although they are not practical for hearing aid use as yet.

Who will be benefited by wearing an aid? It has been said that anyone who has difficulty in hearing ordinary conversation should think seriously of wearing an aid if, after competent examination, no other treatment is more feasible. It is interesting to note that at the Naval Rehabilitation Center "only 6 out of 3,000 persons were so hard of hearing that they could not profit by an aid and training in its use." Not only will the wearer of an aid be benefited if the aid improves his hearing, but also his family and friends will be helped greatly by being relieved of the annoyance and embarrassment of having to repeat and shout.

About 90 per cent of the hearing aids now in use are of the vacuum tube air conduction type. A few of the manufacturers are still distributing aids of the carbon type, although there is rarely any justification for their use. The bone conduction receiver is still occasionally indicated.

Modern vacuum tube aids are quite similar, one to another, in construction and design, although of course there are some differences in size, weight, workmanship, appearance, and electro-acoustic properties. Each instrument consists of a microphone, an amplifier with two, three, or four midget vacuum tubes, condensers, resistance coils, volume and tone controls, a receiver or a bone oscillator. An A and a B battery are required. The A battery is 1½ volts and the B battery from 15 to 45 volts. There is considerable difference in the tonal quality of most of the instruments manufactured by the various companies. This is partially accomplished by varying the "hook-ups" of the component parts.

TWO TYPES OF RECEIVERS

There are two types of receivers used, the magnetic and the crystal. The magnetic is usually a little larger and heavier and is better for reproducing lower tones. It is preferred for patients whose hearing impairment is of the flat curve loss or conductive type. The crystal is more commonly used because it is smaller and lighter and it is better for amplification of the higher tones, although it does have more distortion and objectionable noises.

There are about 40 manufacturers now producing aids. Fewer than half that number were accepted by the Council on Physical Medicine of the American Medical Association in 1947. Most of the manufacturers have various models with different characteristics. Some transmitters are designed for only one receiver while others can be used with as many as five different receivers. Various B battery voltages are used. The total number of possible combinations, according to the investigators at the Philadelphia Naval Hospital, is well over a thousand.

At the Army and Navy rehabilitation centers, and at the other recognized hearing centers, only those aids which are accepted by the Council on Physical Medicine of the American Medical Association are recommended. This council renders a valuable service by keeping both the profession and the hard-of-hearing patient informed as to which instruments merit consideration for purchase. In order for an instrument to be accepted by the Council, the manufacturer must submit a sample stock instrument which is subjected to extensive and rigid tests by an impartial acoustic physicist. Engineering data must be provided to prove all claims for satisfactory operation. The instrument must be capable of increasing the intensity of sound by at least 30 decibels between 300 to 3,000 cycles. Its inherent noise level must not be excessive. All materials and workmanship in its manufacture must be of the highest quality. The manufacturing firm is responsible for "ethical merchandising practices, financial dealings and contracts of its agents." Misrepresentation and exaggeration of claims in advertising have frequently been the reasons why some of the most highly publicized instruments are not acceptable or have been removed from the accepted list.

The author does not agree with the Council entirely, especially in its acceptance of an aid which is sold by mail only. One of the largest manufacturers makes not only all its sales of instruments by mail, but also all sales of batteries to be used in these instruments. This firm changed the battery terminals so that standard batteries cannot be used. Local suppliers of batteries have remedied that situation, however, by making terminal adapters, thus saving the wearers much inconvenience and expense. Another objection to the Council is that it takes many months to give approval of new instruments. Generally it may be considered safe to recommend a new instrument made by a reputable manufacturer if previous models by the same maker have been accepted.

Fitting a hearing aid to an audiogram is known as "mirroring" or "selective amplification." So far, it has proven impractical. The instruments now available are not flexible enough in adjustment to permit selection of frequency amplification except in a very narrow range. Sometimes losses are missed by the audiometer because they occur between the octaves recorded. The acoustic properties of an aid are influenced considerably by the "body baffle" effect of the patient himself. That is, the tonal quality of an instrument is quite different when tested alone and when tested in contact with or in close proximity to the wearer's body. Furthermore, those who have been hard-of-hearing for a long time develop a peculiar "speech hearing" pattern which cannot be corrected by selective amplification alone. However, the audiogram is a very important and necessary adjunct for proper diagnosis, especially as to quantity and type of hearing loss.

There is no longer much controversy over the relative merits of bone conduction and air conduction instruments. Air conduction receivers have definitely proven their superiority. Not only are they far more economical, but they are more efficient even in those cases in which the patient gets a greater volume of sound by bone conduction than by air conduction. The bone conduction receivers do not amplify adequately the higher tones so necessary for distinguishing consonants. Moreover, much more power is required for their operation, which means that the instruments will be bulkier and more expensive to operate. About the only cases in which their use is justified are those in which the patient has bilateral suppurative chronic otitis.

For the individual with hearing loss caused by impaired conduction of sound, practically any of the accepted aids will prove satisfactory. The problem in most of these cases is to persuade the patient to wear an aid. This problem, fortunately, is gradually diminishing, probably because it has been estimated there are almost a million persons who are now wearing aids in this country. For those who are not concerned with vanity, the conspicuousness is often an asset. Many people wear aids to indicate their infirmity in order that people will speak more loudly and distinctly to them.

Carhart and Thompson[1] have divided the process of fitting aids into steps which are simple and logical. The following is the procedure they suggest:

1. Thorough medical and audiometric study of the patient.
2. Decision regarding the feasibility of a hearing aid and the type of instrument to be specified.
3. Procurement of an individual ear-piece whereever air conduction fittings are to be tested.
4. Preliminary selection through appropriate screening of a manageable number of fittings which are particularly promising for the patient.
5. Detailed testing to discover the help which the patient receives with each instrument surviving the preliminary selection.
6. Recommendation, on the basis of test results and the patient's special problems, of the instrument best suited for him.
7. Auditory training designed to adjust the patient to the instrument chosen.

To carry out these suggested steps, the services of an acoustic laboratory are of course necessary.

If the patient does not have convenient access to one of these laboratories, he should get the recent book edited by Hallowell Davis,[2] entitled "Hearing and Deafness." Although primarily a guide for laymen, it should be read not only by every hard of hearing or deaf person, but by every otologist as well.

With rare exceptions, a hearing aid salesman is, of course, not a disinterested or impartial judge of what is best for the individual. For that reason, there is a chapter in the book just mentioned in which the reader is told how to determine quite satisfactorily the various features of performance he should look for in an aid. The tests described can be made at home or on the dealer's premises.

The following are the features of performance discussed in that chapter:

1. Tolerability.
2. Intelligibility of ordinary speech.
3. Intelligibility of faint speech.
4. Intelligibility of difficult words.
5. Freedom from internal noise.
6. Aesthetic "quality."
7. Intelligibility of speech under difficult conditions.

A number of instruments should be tried and an accurate score of each one of these features should be kept. The test words, sentences, and method of scoring are all given in the book.

Besides these features of performance, other important factors listed are:

1. Availability of dealers.
2. Acceptance by the Council on Physical Medicine.
3. Service, batteries, and earmolds.
4. Size, cost, and convenience.

For obvious reasons an aid should never be purchased by mail. One should be selected from a reputable dealer or representative in the community in order to facilitate instructions in using, servicing, and repairing. A so-called universal ear-piece should not be used. Any dealer can arrange for the making of an individually fitted ear mold to which any of the present models of receivers may easily be attached. Thus, serious irritations to the soft tissues of the ear, and leakage of sound between the canal and the mold, can be avoided. This leakage, if present, is responsible for an annoying "squeal" which is called "feed back" because of the receiver transmitting sound back to the microphone. The better "single unit" instruments do not vary significantly in size, but there are wide differences in cost. Therefore, if the performance and other features are about the same, there is no reason why the most economical aid should not be chosen.

Battery cost and consumption should also be given thoughtful consideration if one is interested in limiting the expense of operation. The old zinc cells are far more economical than the newer mercury types, although the latter have a more uniform output of voltage than the former.

There is a tendency for the hard-of-hearing person to prefer the smoother and more mellow tones of an instrument which does not amplify the high tones sufficiently. However, for the sake of intelligibility the consonant frequencies, although not so pleasant, are more important than the vowel frequencies. For this reason crispness of sound, rather than mellowness, should be the guide.

In determining whether to attach the aid to the right ear or the left, Thompson suggests: "If there is an average moderate loss and the patient can still use the telephone satisfactorily, the ear not used in telephoning is used; if there is a disparity between the ears, for example if one ear has a 40 decibel loss and the other a 70 decibel loss, the better ear is used; and likewise, if there is a bilateral extensive loss the better ear is used." In some cases of course there will be unusual problems requiring individual solution.

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Discussion by Walter P. Work, M.D., *San Francisco*

There is a healthy movement afoot, as pointed out by the author, for the establishment of aural rehabilitation clinics in this country for civilian use. I urge all otologists to become familiar and intimately associated with these centers if possible. It is not enough to refer a patient to one of them and then dismiss him from mind. The otologist must help lead the patient through the pitfalls encountered in using a hearing aid and further must act as a counsellor and physician.

In communities where there are no hearing aid clinics, the otologist must assume more responsibility. Specifically, the otologist must test hearing and determine the need for a hearing aid. He should also settle the problem as to whether the hearing aid should be of the air or bone conduction type. Further, the ear to be fitted can be determined and a standard acrylic ear insert with the universal bushing may be fabricated. This is important, for then the patient is free to go to as many hearing aid companies as the otologist directs. When a hearing aid is first tried, the patient must go through an initial period of learning to listen to amplified speech and sound. In the observation of some 4,000 patients, it was found that this period is quickly passed. No hearing aid should be judged before there have been several hours of practice. In order to get a patient past this learning phase, he may be directed to go to a hearing aid company and try out a hearing aid on successive days. The type of hearing aid during this phase is not important. After this initial period of learning, the patient is then advised to try to determine which of four or five gives him the best acoustical response. This process of shopping is one of the weak links in the whole process of procuring a hearing aid. Once the hearing aid that gives the best acoustical response is found, the salesman and the patient should return to the otologist's office, where the salesman should demonstrate why this aid is the one for the patient. During this demonstration the otologist must be alert to the following:

1. The ability of the patient to respond to speech intelligibility tests in quiet and noise. (Noise may be introduced from a Barnay noise box at various distances from the hearing aid microphone). This determines the ability of the hearing aid to shut out background noise.

2. The reserve power of the instrument. This may be noted by the position of the volume control at comfortable loudness settings.

3. Sound localization.

4. The patient's tolerance to loud noises. It may be predicted, if there is low tolerance, that the patient may require special advice regarding the use of the hearing aid.

5. The quality of the hearing aid and the service policies of the company selling it.

Once the hearing aid is purchased the patient must be advised regarding auditory training which is deemed most important. Auditory training consists of two phases:

1. Instructions regarding the use and care of the hearing aid.

2. Improving listening ability—that is, retraining residual hearing or retraining the patient's sound memory.

The first phase of auditory training is usually taken care of by booklets and pamphlets made available through the hearing aid company. The second phase must be handled by a definite schedule of listening hours. The patient must be encouraged to use the new aid in a succession of life situations, each one being more complex.

The otologist must advise the patient regarding lip reading instruction and speech correction if the latter is needed. Lastly, the otologist may have to act as a psychological and vocational counsellor. This is the role the otologist must play if no hearing aid clinic is available in his community. Even if a clinic is available, the otologist's duties as pointed out previously should not end when the patient is referred to such a clinic.

There are many phases of this subject that cannot be dwelt upon in this discussion. However, I would like to point out that most discussions such as this overlook the child who is hard of hearing or deaf, and at the same time to urge that it is feasible to fit a young child with a hearing aid if that child is properly guided.

Dr. Duggan spoke of "mirroring" the audiogram. It has been shown by acoustical research with the master hearing aid, that either straight line amplification or amplification that rises 3 to 6 decibels per octave is the best acoustical response that can be obtained in a hearing aid. When this is accomplished by all hearing aid companies, fitting problems will not be so great.

Early Ambulation in Obstetrics and Gynecology

STIRLING PILLSBURY, M.D., *Long Beach*

SUMMARY

Early ambulation has been a large factor not only in decreasing many of the complications that may follow childbirth and gynecological operations, but in reducing the time of convalescence.

SINCE the dawn of history, early rising after childbirth has been practiced by nearly all primitive races and by others who, through necessity or otherwise, have been unwilling to accept the teachings of the medical profession.

Owing to the greater complexities of child bearing in modern civilization, and perhaps in recognition of a decline in the ruggedness of the human body, the medical profession long accepted as routine the keeping of women in bed for various lengths of time following the delivery of a child. This was done in the conviction that it was a means of preventing serious complications and was for the future good of the individual. Medical teaching was that rising too early after parturition was liable to dire consequences such as excessive bleeding, infection, embolism, and permanent herniation through the vaginal tract.

Most physicians, however, have seen patients who, through necessity or disbelief, did not remain in bed the accepted length of time, but who got up and carried out their usual duties a day or so following childbirth; and it has been surprising to note that these patients, for the most part, convalesce normally.

Moreover, it has been noted that animals are able to resume their usual habits soon after bearing offspring, or after surgical operations, and that complications in them are rare.

Early ambulation can be defined in various ways. Ambulation, as the term is used in this presentation, means getting out of bed and moving about. Early, as defined by various individuals, is from six hours to four or five days after delivery. It should be emphasized that early ambulation distinctly does not mean early resumption of usual household duties or others requiring strenuous exercise.

For several years certain members of the medical profession have been reporting excellent results in allowing patients to walk and to carry out various exercises out of bed very soon after childbirth and surgical operations.[5] During the last ten years, there have been many reports[2, 4] of series of cases in which early ambulation was permitted. Because of extremely crowded conditions in hospitals in recent years, physicians have been urged to send patients home early. This, together with a shortage of nursing help, has tended to encourage patients to do more for themselves and to get out of bed much earlier than was the custom.

The author's interest in this subject was aroused early in 1944 when he had occasion to observe two obstetrical services that were conducted in separate Army hospitals caring for approximately the same number of cases. The patients in one hospital were allowed to get out of bed and walk within 24 to 36 hours following delivery, while those in the other were required to remain in bed the conventional eight days and were not discharged until the tenth day.

At the end of approximately a year's time, the results of these two series were compared. All cases during this period were carefully, even skeptically, followed for any evidence of complications or poor results which might be attributable to early ambulation. It was found, however, that the women who were permitted to get out of bed early had a much shorter and less complicated convalescence and a greater sense of well-being upon leaving the hospital. A lower morbidity rate was noted among the women who had been permitted early ambulation. No cases of thrombosis were noted among them, although there were several cases among the patients who were required to remain in bed for a longer period. Perineal wounds healed as readily in patients permitted early ambulation as in those who remained longer in bed, and no greater evidence of vaginal herniations was noted.

Early in 1946, early ambulation was instituted at Seaside Memorial Hospital in Long Beach. At first the procedure was prescribed by only a few of the physicians treating obstetrical patients in the hospital, but in time others adopted it with the result that an increasing percentage of patients were permitted early ambulation. Concurrently there was a decline in maternal morbidity from 3.7 per cent in 1946 to 2 per cent in 1947. During this period there were 4,178 deliveries including cesarean sections without a maternal mortality.* Although no doubt there were other factors contributing to these low figures, early ambulation must be given its share of the credit. There was only one known case of throm-

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Presented before section on Obstetrics and Gynecology at the 77th Annual Session of the California Medical Association, San Francisco, April 11-14, 1948.

*Since this presentation was prepared, the number of deliveries without a maternal death has increased to 5,427.

bosis during this period, and it occurred in a patient who did not get out of bed until the fifth day.

The routine at Seaside Memorial Hospital has been to have the patient dangle her feet over the edge of the bed several times a day 12 hours after delivery, to have her walk around the room several times after 24 hours, and walk down the hall and have bathroom privileges after 48 hours. She is also encouraged to move about in bed as much as possible at all times. We have set 24 hours as the maximal time for remaining in bed because it has been pointed out by several authorities that thrombosis of the extremities usually occurs within two to four days following injury of the tissues and stagnation of the circulation.

By early use of the muscles, circulation is increased throughout the body, which accelerates healing and early return to normal functions of both muscles and pelvic organs. It is felt that the increase in circulation is a great factor in early involution of the uterus, which reduces the hazard of infection and hemorrhage in that organ. In addition the upright position gives better drainage of lochia from the uterus and from the vagina. Early rising encourages deeper respirations and increases circulation through the lungs, thereby decreasing chances of pulmonary complications. Perhaps the greatest reward, however, is the often stated sense of well-feeling on the part of the patient. All patients who have tried early ambulation are enthusiastic about it, and all who were multiparae have said the convalescence following this procedure was much more satisfactory than that following their previous pregnancies.

We have made it a rule that no patient will be required to conform to the previously mentioned time schedule for early ambulation, but we do require that patients who do not get out of bed within the first 48 hours must remain in bed the allotted eight days before they are permitted to walk. This is done to prevent liberation of emboli from thrombi formed early in the postpartum period, and to permit recognition of the signs and symptoms of a thrombus, which usually occur four to eight days postpartum.[1, 3]

Results of early ambulation in gynecology are almost parallel to those in obstetrics. For years, many surgeons have advocated leg exercises after all kinds of operations. In the past few years, surgeons have been encouraging patients to walk within a few hours after major surgical procedures. In this regard it is appropriate to remind ourselves of the results which have been obtained in operations on animals, with no effort made to keep the animals quiet afterward. Also, we have known for years that convalescence after operations on young children was shorter and less complicated than the convalescence of adults. Undoubtedly contributing is the fact that children cannot be kept quiet in bed after operations and have therefore, in effect, practiced early ambulation in bed.

On our service, patients who have been operated upon are permitted to follow the same routine as obstetrical patients. Here again patients who have undergone repeated cesarean sections offer the information that convalescence is more satisfactory with early ambulation. Because of the prejudices built up over a long period, it is sometimes hard to convince patients that it would be to their best interest to exercise while in bed, and to get out of bed early. But in my experience all patients agreed, after the first one or two attempts at getting out of bed, that they felt much better than they expected to and were glad they had made the effort.

Increase in circulation of the extremities, in the abdominal wall, and in the abdominal and pelvic contents, has been a large factor in preventing a great many of the common complications and discomforts following operations. Gas pains, distention, nausea, and vomiting, have practically become something of the past. It has been stated on several occasions that early movement of the abdominal contents helps prevent adhesions and that increasing the circulation is a factor in the healing of injured tissues and in the quicker healing of abdominal wounds.

We have noted a marked reduction in the amount of sedation needed for patients who are allowed early rising. Strong sedation is rarely needed after the first 24 hours; this, we feel, is a great factor in the prevention of ileus.

Contraindications to early ambulation are few, and some which were formerly considered valid have been discarded. We feel that a patient with a temperature of 101° F. or over should not be allowed out of bed, at least not until the cause is known. Some physicians, however, believe that this is not a reason to keep patients from early ambulation; on the contrary, that walking may help reduce the fever. Hemorrhage, although rare, is certainly a reason for keeping the patient quiet.

There is a great deal of difference of opinion as to whether patients who have undergone surgical repair, either at the time of childbirth or as a separate operation, should be encouraged in ambulation. It is reasonable to believe that in some instances early ambulation might cause sufficient increase in abdominal force to break down a repair of herniation through the vagina.

The fact that the patient feels so well in a few days following delivery or operation leads to the question, "Why can't I go home?" Many patients wish to leave the hospital the second or third day following delivery, and even three or four days following major operations. And while patients who have been permitted early ambulation can safely leave the hospital several days earlier than they might otherwise, complications such as thrombosis, infections and wound separations still do occur in such patients, and for that reason they should remain under observation until these dangers are past. Moreover, patients must be warned repeatedly against too vigorous exercises and against doing too much until the body has had time to recover and wounds are safely healed.*

419 Professional Building.

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Discussion by ROBERT D. DUNN, M.D., *Palo Alto*

Doctor Pillsbury has presented a paper on an extremely important subject.

The subject with which Dr. Pillsbury has dealt is important not only because of the shortness of hospital beds but also because of the implication of possible reduction of complications in postpartum patients. In anticipation of this discussion, I reviewed a thousand consecutive obstetrical cases from my private records of 1947 and a similar number from 1941 and 1942. These are not exactly comparable, as in the earlier group relief of pain was obtained by analgesia and in the recent group caudal anesthesia was used in most cases. In the early group there was a morbidity of 1.8 per cent. In one-third of these cases morbidity was due to endometritis, or intra-uterine infection. In the more recent series there was a morbidity of 1.2 per cent—not a significant difference in the morbidity, but significant, I think, in that there was only one endometritis. Most of the morbid conditions were due to breast infection, which I think is not influenced by early ambulation. Unfortunately from the standpoint of comparative data, there were no cases of embolism in either group.

I think we may definitely say that early ambulation in obstetrics lowers the incidence of postpartum intra-uterine infection.

The well-being of the patient is extremely important in this type of postpartum care, but there is one disadvantage which I would like to emphasize. When the patient is allowed to go home early, often the family considers the patient perfectly well and the time of convalescence finished, so that some patients immediately pick up their household duties and over-do. Thus, they become completely tired out and it takes them some time to recover.

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*As to the legality of early ambulation, Louis J. Regan, M.D., LL.B., legal counsel for the Los Angeles County Medical Association, has advised that in general the concept is that if the procedure is advisable medically it is defensible legally. This aspect is mentioned because the author has been informed that several actions are pending for recovery for damages alleged to have occurred as a result of a patient's having been allowed to leave the hospital too early.

Leukocytes in "Virus X" Infection

CARROL S. SMALL, M.D., and G. GORDON HADLEY, M.D., *Loma Linda*

SUMMARY

Study of blood taken from patients with the recent "Virus X" "flu" syndrome showed slight leukopenia and the presence of abnormal lymphocytes, the most characteristic of which were those showing basophilic cytoplasm. These cells, often called Turk cells, and which the authors have termed "toxic" lymphocytes, are similar to those found in other virus infections.

DURING the recent epidemic of respiratory infections widely publicized as "Virus X" infection, but actually traced to type A influenza virus in most of the infections studied by the California Department of Public Health,[2] the authors of this presentation were intrigued by the bizarre lymphoid cells observed in smears of blood taken from patients who had the disease. This prompted a systematic study of the blood picture of these individuals, most of whom were medical students, nurses, and hospital employees. A series of 50 cases of this influenza syndrome, seen at the Loma Linda Sanitarium and Hospital between November, 1947, and January, 1948, is here reported, with emphasis on hematologic findings.

All these patients complained of sore throats, backache, weakness, and general malaise. Their ages varied from ten months to 67 years, with an average age of 31.4; 11 were male, 39 female. Physical examination revealed injected pharynx in many, and occasional basal rales in a few of the patients. Cases in which there were complications which would be known to alter the blood picture are not included in the series. All patients were discharged well after a few days, and no later complications have been reported. All had, as routine procedures, erythrocyte and leukocyte counts, differential leukocyte study, and hemoglobin determination. On the blood smears (stained by Wright's method) at least 200 cells were routinely classified, and in subsequent study at least 500 were observed on each film.

The total leukocyte counts ranged from 2,250 to 10,450 per cu. mm., with an average of 6,560—somewhat higher than had been expected (see Table 1). The average differential count was: polymorphonuclear neutrophils, 45.1 per cent; stab forms, 11.2 per cent; lymphoid cells, 32.8 per cent; eosinophils, 1.5 per cent; monocytes, 9.8 per cent; basophils, 0.4 per cent.

The lymphocyte types which especially attracted attention were as follows:

I. Cells, up to 18 microns in diameter, with dark blue opaque slightly uneven or granular cytoplasm, and with nucleus about two-thirds the diameter of the cell. The nucleus was dark purple, and the chromatin the usual "lumpy" texture of the adult lymphocyte. No azurophil granules were observed in this type. Similar cells are often seen in the blood of patients with German measles, infectious mononucleosis, and measles.[1, 3, 6]

Some of these cells had a distinct semilunar pale area in the cytoplasm adjacent to the nucleus. In this one respect they resembled the "plasma cell," but the nucleus was not usually as sharply eccentric as in a typical plasma cell[1] (see Figure 1).

TABLE 1.—*Range of Leukocyte Counts in Patients in Series*

Leukocyte Counts	Percentage of Cases
Under 4,000	2
4,000- 5,000	22
5,000- 6,000	22
6,000- 7,000	14
7,000- 8,000	16
8,000- 9,000	12
9,000-10,000	6
Over 10,000	6

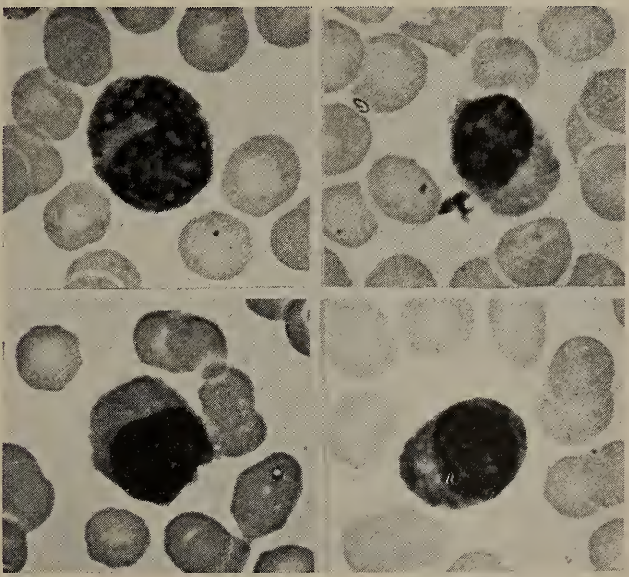


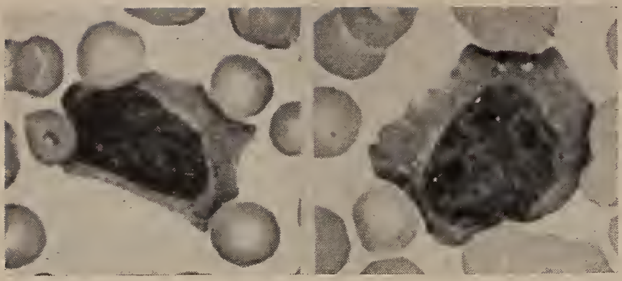
Figure 1.—Cell at upper left shows definite basophilic cytoplasm with an eccentric nucleus containing clumped chromatin. There is a perinuclear halo.

Cell at upper right shows features similar to A except the chromatin is more clumped and the semilunar area around the nucleus is lighter.

Cell at lower left shows basophilic cytoplasm.

Cell at lower right shows eccentric nucleus with pale semilunar area in the basophilic cytoplasm.

From the Department of Pathology, College of Medical Evangelists.



Left, Figure 2; right, Figure 3.—Figure 2 shows a type II cell with a tendency to fold around adjacent erythrocytes. The type III cell in Figure 3 shows a tendency to cytoplasmic vacuolation and a general foamy appearance.

II. Cells as large as those pictured in Figure 1, with dark-staining lumpy nucleus, but with pale "transparent" blue cytoplasm, often much darker at the cell periphery. These cells seemed to have very low cytoplasmic viscosity, for they flowed in among the more rigid erythrocytes on the slide, and easily conformed to irregularities in the contour of adjacent objects. The nucleus of these cells was usually not as dark as that of type I cells (see Figure 2).

III. Cells with any of the nuclear characteristics heretofore described, but with distinctly vacuolated or fenestrated cytoplasm. These often lacked the limpid transparency of cytoplasm of type II, and might be "hazy" or turbid with tiny reddish granules like those in monocytes (see Figure 3).

In our laboratory the general term "toxic lymphocyte" has been adopted for "type I" as previously described. As thus used, the term indicates a lymphoid cell which labors under the burden of some toxic or infectious influence, but is not a lymphoblast, and is not necessarily immature. The eponym "Turk cell" is often applied to such cells, but a more morphologic name[4, 5] was preferred.

In a study of the blood films in this series, it was easy to find what appeared to be cells in all stages in the transformation of lymphocytes to "plasma cells." However, whether that is fact or merely appearance, the authors are not prepared to say.

Although it cannot be said that the previously described lymphocyte aberrations are diagnostic of influenza or any other one clinical syndrome, they do indicate some toxic process, usually a virus, or at least a non-bacterial, infection. They are quite frequent in children in a great variety of diseases, and less common in adults. In this group are many cells which are borderline types and no doubt would probably be called large lymphocytes in an otherwise normal differential count.

In the blood specimens from 49 patients in the series, some or all of the types described were observed. Type I cells were found in 23 cases and on an average made up 2.4 per cent of the total differential count. Type II cells were found in 39 cases, and type III cells in 49 cases.

The average percentage relationship of abnormal lymphocytes to total lymphocyte count was as follows: Type I, 3.4 per cent; type II, 18.4 per cent; type III, 31.7 per cent.

These three cell varieties emphatically are not described as distinct types. They are simply prominent "lines" in the continuous spectrum of variations in lymphoid cells. Nuclei vary from the pronounced cartwheel or "Radkern" style of the plasma cell to the fine lacy structure of the monocyte. However, no "blast" cells were seen—that is, none with fine-textured embryonic nuclei — and none contained nucleoli.

In some cases in the series it was impossible to categorically exclude the diagnosis of infectious mononucleosis by the study of the blood smear alone. When such difficulty arose, a negative "Paul-Bunnell" heterophil antibody reaction and the absence of lymphadenopathy and splenomegaly was accepted as sufficient to rule out mononucleosis.

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CASE REPORTS

Renocolic Fistula
Meningovascular Myelitis in Early Syphilis

Renocolic Fistula

H. Verrill Findlay, M.D., *Santa Barbara*

RENOCOLIC fistula was reputedly described by Hippocrates. Rayer[10] in 1841 gave a clear description of this lesion and presumed that it followed a long standing renal infection with probable perirenal abscess. No better theory of the production of this lesion has been produced since Rayer's time.

In spite of the long history of our knowledge of this lesion reports of cases are relatively rare. Mertz,[5] in 1931, collected from the literature reports of numerous cases of upper urinary tract fistula to show the relative frequency of occurrence at various sites. He found reports of two renogastric, three renoduodenal, nine renobronchial, and 29 renocolic and ureterocolic fistulae. By way of contrast and to show the greater prevalence of lower urinary tract fistula, it may be noted that Fowler[2] in 1928 reported 500 cases of vesicointestinal fistula. Vermooten and McKeown,[12] reviewing the literature in 1933, found reports of 26 cases of renocolic fistula. Ratliff and Barnes[9] in a review in 1939 found 11 more. Pedroso, Anglada and Pedroso[8] in 1940 reported an accumulated total of 43 cases, including two of their own. A cursory review of the literature since then shows Markowitz and Katz[4] have reported two cases, Minuzzi and Torresi[7] one, and Miller[6] one and Liebich[3] one. This paper adds one more, making a total of 49 cases reported to date.

As its name implies, a renocolic fistula is one connecting a kidney and the colon. Rayer was of the opinion that the lesion was primarily the result of chronic renal inflammation which produced a perirenal abscess that ultimately ruptured and drained into the colon.

Study of the reports of individual cases leads to the conclusion that this is the way most of these fistulae are produced. The lesion is always primary in the kidney. No case has been recorded with an initial bowel lesion. As the colon at the region of the hepatic and splenic flexures is in intimate contact with the anterior surface of either the right or left kidney, rupture of a perirenal abscess into the colon is understandable. A surprising phenomenon is that the fistula passes through the wall of the cortex rather than the wall of the pelvis of the kidney.

Ratliff and Barnes, in reviewing reports of 37 cases, noted the following associated and probable causative lesions: renal tuberculosis in five cases, renal calculi in 14, and pyelonephritis in 18. No case in which there was associated malignant growth in the kidney was found by them, and they found no case in which the primary lesion was in the bowel.

The patient's history and results of urinalysis may suggest renocolic fistula, but diagnosis may be confirmed only by retrograde pyelograms. A patient who has this disease usually appears debilitated and is chronically ill. Frequently there is a history typical of perirenal abscess, with symptoms suddenly subsiding but blood-streaked stools appearing concomitantly. There are not, in the typical case, constant symptoms of bowel disorder.

Findings upon physical examination may not be characteristic or striking except for evidence of chronic sepsis. Urinalysis usually discloses marked pyuria. Intravenous pyelograms do not constantly nor reliably demonstrate the lesion. Cystoscopic study reveals chronic cystitis. A pyelogram of the kidney, if the kidney is adequately filled, will demonstrate the fistulous tract, and the media should flow into the colon after occasionally filling a perinephric abscess cavity. Typically, the affected kidney pelvis cannot be distended to the point of pain because the injected media will escape into the colon. A barium enema is unnecessary for diagnosis and usually of little help. Riaboff and Feldman demonstrated the fistula by means of a barium enema in one case.

The curative treatment of renocolic fistula is nephrectomy with ligation of the fistulous tract as near to the colon as possible. In aged, debilitated or very ill patients this may not be feasible. Ratliff and Barnes report an operative mortality of 33 per cent in cases reported to 1939. A perinephritic abscess may be drained primarily and later a nephrectomy and ligation of the fistula done. An occasional patient will withstand only nephrostomy. Some die without benefit of operation. In some cases colonic cutaneous fistulae occur postoperatively. However, this lesion is so severe in effect upon the patient's health that considerable operative risk is warranted.

CASE REPORT

A 56-year-old white male consulted his physician because of pain in the left renal area, dysuria and cloudy urine for over three months. In 1938 the patient had been operated upon for removal of a left renal calculus following several disabling attacks of colic, but he had been told by the surgeon that the stone had not been removed. The patient was positive that there had been no diagnosis of perirenal abscess preoperatively, and questioning elicited no recital of symptoms at that time which might have indicated the presence of the lesion. Convalescence from the operation was slow, with urinary drainage from the wound for eight weeks. After recovering, the patient resumed work as a rancher and was free of symptoms for five years.

Two or three years before the present illness, aching developed in the left flank and recurred periodically. However, there were no urinary symptoms. Three months before he was examined by the author, the patient had had what he termed "flu" which began as an upper respiratory infection and then "settled in my bowels." There was left upper abdominal pain and aching and tenderness for about two weeks, followed by loose stools and disappearance of these symptoms. Blood was not observed in the stools at this time, although it was not searched for.

Weak, emaciated, discouraged, chronically ill when he came under the author's observation, the patient was hospitalized without delay. General examination disclosed nothing of note. The abdomen was thin and no masses were

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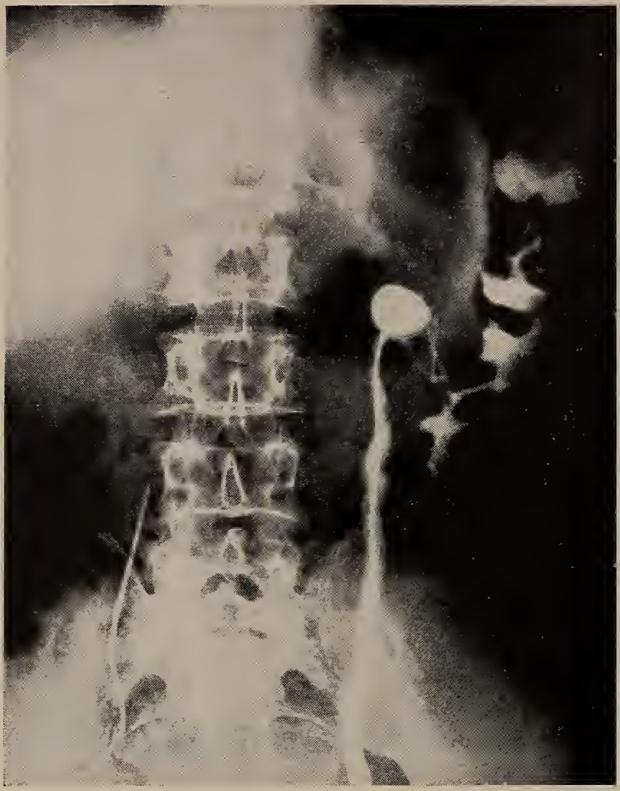
Presented before the Section on Urology at the 77th Annual Session of the California Medical Association, San Francisco, April 11-14, 1948.



After rapid injection of 50 cc. sodium iodide solution, the tiny pelvis surrounding the left renal calculus, the fistulous tracts, and partial filling of the descending colon were demonstrated. This film established the diagnosis.

found, although there was some tenderness over the anterior end of the well-healed left lumbar scar. External genitalia were normal and the prostate normal in size and texture for his age. A voided specimen of urine was cloudy, and over 1.0 cm. of pus settled in the bottom of the centrifuge tube. Results of urinalysis were otherwise normal. Erythrocytes numbered 4.6 million with a hemoglobin value of 86 per cent and leukocytes numbered 6,100. The nonprotein nitrogen level was 37.5. Results of a Kahn test were normal. Urine specimens from the left kidney and bladder contained much pus and B. coli on culture, whereas urine from the right kidney contained no pus and no growth on culture. A roentgenogram of the chest showed no abnormality of the heart or aorta. There was moderate generalized emphysema.

A cystoscopic study showed no intrusion by the prostate, but generalized subacute cystitis was noted. Urine came from the right ureteral orifice in spurts, but none was seen coming from the left orifice. A No. 6 (French) catheter was passed up each ureter easily and a normal flow of clear urine was obtained from the right kidney, but only a small amount of thick pus could be aspirated from the left. Roentgen studies, including pyelograms, were made and a few calcific flecks were noted in the parenchyma of the right kidney, which was otherwise normal. At the upper end of the left ureteral catheter was a round, laminated calculus 2.5 cm. in diameter, apparently in the left kidney pelvis. When a small amount of 12½ per cent sodium iodide solution was injected into the pelvis through the catheter, a tiny pelvis closely surrounding the calculus was demonstrated with a satisfactory filling of the ureter. When larger amounts of the solution were injected, the three sinus tracts leading downward and lateralward from the kidney pelvis were filled and eventually the descending colon was partially filled. As the right kidney was found to be functionally good although probably containing early calculi, operation was decided upon to close the fistula and eliminate the serious urinary tract infection.

Left nephrectomy was done with the patient under pentothal and gas-oxygen anesthesia. The left lumbar scar of the previous operation was excised and the left lumbar muscles incised. As the normal perirenal fat had been replaced by dense scar tissue, dissection was extremely difficult. Although the left renal calculus was felt, no surrounding tissue suggestive of a kidney was palpated. With the field properly exposed, sharp dissection was used and a small amount of fibrotic, fat-surrounded tissue enclosing the calculus was freed with an adjacent 12 cm. of ureter. The fibrotic band, thought to be the fistulous tract, was then carefully followed downward and medialward through a mass of fat until the wall of the colon was exposed. This band was doubly ligated with a No. 00 chromic tie. Within the renal pedicle was a minute artery which was ligated and divided. Then the ureter was similarly treated and the mass removed. The wound was closed in layers with a drain after 4 gm. of sulfanilamide powder had been dusted into it. Time for the procedure was 45 minutes, and the patient was taken from the operating room in good condition.

Convalescence was stormy. The patient reacted poorly and slowly from anesthesia, showing profound narcosis and marked hypotension. A transfusion of whole blood was given, whereupon the temperature rose to 107° F., although a recheck of the donor's and the patient's blood revealed no incompatibility. After three plasma transfusions and other supportive measures in the first 48 postoperative hours, progress, although slow, was satisfactory and the patient was out of bed in seven days. Weakness and anorexia continued, but there were no specific complaints. On the ninth day following operation, a severe left corneal ulcer, which was refractory to treatment, developed. Penicillin was given for ten days postoperatively and the operative wound healed satisfactorily. When the patient left the hospital 17 days after operation there was a small amount of serous wound drainage. Few pus cells were found in an examination of the urine at that time.

The pathologist reported that the mass of fat and fibrotic tissue removed weighed 55 gm. without the stone which measured 2.7 x 1.7 cm. The only tissue which could possibly be identified microscopically as kidney consisted of a few areas of dilated renal tubules and renal pelvis epithelium. The rest of the areas showed only fat, chronic inflammatory tissue, and fibrosis.

The patient made a slow but progressive recovery. A small amount of clear serum continued to drain from the wound for four months before healing was complete. At no time did the draining serum look or smell like urine or fecal material. The urine remained clear except for an occasional leukocyte. When last seen, six months after operation, the patient was doing light ranch work and the wound had healed. There were still a few leukocytes in the urine.

COMMENT

In reviewing this case, doubt arises as to when the renocolic fistula developed. It may have developed soon after the initial operation, or it may have occurred when pain in the left loin was noted five years later. However, it would seem most likely that it developed during the bout of so-called "flu," some three months prior to the second operation, for not until then had the patient had severe pain and tenderness in the left renal area, suggesting an abscess, and it was not until then that urinary symptoms were noted.

CONCLUSIONS

Renocolic fistula is not a commonly reported lesion. Once suspected, diagnosis of it can be certainly established by retrograde pyelogram. The treatment of choice is nephrectomy with ligation of the fistulous tract.

A case is reported in which recovery followed operation.

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Meningovascular Myelitis in Early Syphilis

Ernest K. Stratton, M.D., *San Francisco*

ACUTE myelitis of syphilitic origin is a rare condition in the United States if the available case reports are a true indication of its frequency. For it to occur within six months following the primary infection, however, is still more unusual.[2,3,6] Many of the cases of acute myelitis reported during this period have been due either to the Jarisch-Herxheimer reaction following the first injections of arsphenamine or to a hemorrhagic myelitis from arsenical intoxication.[1,4,7]

When this tragic involvement occurs during therapy a differential diagnosis between these three possible causes is in many instances a difficult one to make. The neurological signs and symptoms of cord damage resulting from any one of them are more or less the same, regardless of the precipitating cause. If the patient recovers, credit is usually given to the method used in handling of the case and an etiological diagnosis is established on that basis. For the patient who dies, only examination of a cord section absolutely ascertains which process is the responsible one.

The following case report illustrates the problem involved under such circumstances:

CASE REPORT

The patient, a white female, was examined March 8, 1943. The skin on the entire body was covered with maculopapular eruptions of secondary syphilis and there were mucous patches in the mouth, as well as generalized lymphadenopathy. The patient complained of dull bifrontal headache. Results of blood tests by both the Kolmer and Kahn methods were four plus. Neoarsphenamine, 0.9 gm. intravenously, was given every fifth day for eight doses. Following the eighth injection, generalized arsenical dermatitis appeared. The patient was very ill, the skin of the entire body, including hair and nails, exfoliated, and there was a decrease in body weight of 40 pounds to a total of 115. After eight weeks during which vitamin therapy was the only medication, the patient began to improve and regained 20 pounds. A blood test on June 25 showed that the Kolmer reaction had been reduced to negative and the Kahn to three plus.

Around the first of September, however, the patient began complaining of intermittent deep aching of both lower extremities from the knees down, mostly when sitting. It was present day and night. Also, she complained of a progressive weakness of the knees and a fear of falling. There was incoordination of the legs in walking and she began staggering. The incoordination was worse on descending stairs but present also in ascending. There was "numbness" from the hips down, with decreased perception of touch and temperature. The patient was unable to void except with considerable effort and straining. Marked constipation was present.

A spinal fluid examination made at this time showed 83 cells per cu. mm.; a positive globulin; total protein was 0.107 mg. per 100 cc.; colloidal gold 1113331110, and Kolmer reaction two plus.

The patient had received no antiluetic treatment of any kind since April 20, the date the arsenical toxic skin symptoms first appeared, but in view of the positive luetic findings in the spinal fluid as well as the signs of progressive cord damage, specific treatment was again begun, this time starting with bismuth subsalicylate intramuscularly (0.13 gm.). After two months of bismuth therapy, no improvement was observed, so on November 11 1 gm. of tryparsamide was given intravenously. Nausea followed this injection but no skin reaction. Two grams more of tryparsamide was given on each of the following dates: November 18 and 26 and December 2. Neurological symptoms became more pronounced. The patient complained almost constantly of the sensation of a tight band or girdle squeezing the abdomen. The legs became progressively weaker, the patient fell to the floor and was too weak to arise without assistance.

Physical examination: The general physical examination revealed nothing unusual. The blood pressure, blood count and urinalysis were essentially normal.

*Neurological examination** revealed an uncertain gait, positive Romberg, moderate general wasting of the muscles and marked ataxia. Sensation to touch about the nose was diminished; that from T 10 was variable, with saddle anesthesia. Vibratory sensation was absent below the knees. Reflexes in the upper extremities were exaggerated bilaterally as were the patellar jerks, but the ankle jerks were absent. Plantar responses were equivocal. Examination of the cranial nerves gave essentially normal results.

More tryparsamide was given, followed by a gain in weight and general improvement. However, the bladder, bowel and leg paralysis became more complete. After eight weeks, cystitis, pyelitis and pyelonephritis developed rapidly, and death resulted from streptococcal septicemia and bronchopneumonia in February, 1944. A spinal fluid examination made a few days before death showed the Kolmer to be negative in all dilutions, and the Kahn two plus, the cell count 74 and the colloidal gold 0012332100.

Microscopic findings* in the spinal cord were reported as

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*The neurological examination and report and the pathological examination and report were made, respectively, by Dr. Helen Starbuck, San Francisco, and Dr. Melvin Friedman, University of California Medical School, San Francisco.

follows: Chronic leptomeningitis—fibrous thickening of pia mater and moderate lymphocytic infiltration.

Partial loss of nerve fibers in both dorsal and lateral funiculi, most pronounced in the dorsal columns in the cervical region and lateral pyramidal tracts in the lower thoracic region, suggesting a diffuse parenchymatous destruction within the cord.

Arteritis, syphilitic type, of the larger arteries.

Degeneration of a small percentage of nerve cells in inflamed areas, particularly the anterior horn cells.

Thick collars of lymphocytes around many small blood vessels in gray and white matter.

Intense hyperemia of tiny blood vessels in some inflamed areas.

Few small hemorrhages in gray matter, often but not always near a small blood vessel.

Absence of ring hemorrhages, perivascular necrosis, hydropic or fatty degeneration of endothelial cells, and diffuse uniform neuronal disease.

With the exception of the few small hemorrhages the evidence supports the diagnosis of syphilitic meningomyelitis, and this evidence is quite compatible with that diagnosis. In support of arsphenamine myelitis are the changes in the blood vessels and hemorrhages, none of which are specific or exactly typical, while against this complication is the last noted finding listing the more characteristic findings of arsenic reaction. In the opinion of the pathologist, therefore, the patient undoubtedly had syphilitic meningomyelitis as the principal lesion, and while a superimposed arsenical reaction of minor proportions cannot be entirely excluded, the evidence in its support is very feeble.

While the spinal fluid examination made at the onset of the cord symptoms indicated the presence of a definite luetic involvement of the nervous system and while the signs and symptoms of acute myelitis did not appear until nearly three months after the onset of the arsenical dermatitis, the fact that this patient had been so ill generally from the drug intoxication led to the belief that the arsenic intoxication had played a definite part in the nervous system damage. Bismuth therapy following the spinal fluid examination and later tryparsamide caused no improvement in the condition; in fact it seemed to worsen under antiluetic treatment. Also, the blood Wassermann had reversed from a 4 plus to a negative during the interval when no specific therapy was given and before the cord symptoms developed.

Altogether these observations strengthened the belief that the myelitis was of toxic origin and deterred the author from administering other specific therapy such as Swift-Ellis salvarsanized serum from a donor early in the disease when such therapy might have been of value. Also, the spinal fluid taken just before death showed a reversal of the Kolmer two negative, which again was interpreted as corroborating evidence of toxic etiology. The spinal cord sections, however, indicate that syphilis alone was responsible for the damage. Sections obtained at different levels of the cord showed the same inflammatory reaction. The meninges and vessels of the brain showed similar involvement. The microscopic diagnosis, therefore, was diffuse syphilitic meningovascular myeloencephalitis.[5, 8]

Nonne, a syphilographer of great experience, commenting on his observation of patients contracting syphilis late in life, said: "They are prone to develop early nervous system involvement and such processes in these patients are usually rapidly destructive."

SUMMARY

Acute arsenical dermatitis appeared in a patient being treated for secondary syphilis following the eighth injection of neoarsphenamine: The skin exfoliated, the patient became very ill, lost 40 pounds and for three months was hospitalized. During this period, although no further antiluetic treatment was given, the blood Wassermann became negative and the patient regained 20 pounds.

Symptoms of neuraxis involvement became manifest five months after the primary luetic infection. Spinal fluid findings were positive for syphilis, and, in spite of antiluetic therapy, paralysis ensued and the patient died of intercurrent infection.

Microscopic examination of sections of the cord showed the pathological process to be caused by syphilis and not by arsenical toxicity as was thought probable at the time of onset. This latter possibility prevented the use of more vigorous types of antiluetic therapy at a time when they might have been of value.

490 Post Street.

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CLINICAL SYMPOSIUM

Prepared under the direction of EDGAR WAYBURN, M.D., *San Francisco,* and
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Saddle Block and Caudal Block Analgesia for the Control of Pain in Labor

DR. KARL L. SCHAUPP, JR.:*

CAUDAL anesthesia for control of pain in labor was started at Stanford Hospital about 1942. A satisfactory procedure using the catheter technique was developed, and we have used it in about 6,000 cases since then. With the advent of spinal anesthesia for delivery, and its growing popularity, we decided to investigate its possibilities although we were satisfied with the caudal technique. A series was started in January 1948, using spinal and caudal anesthesia for alternate nulliparas to see if superiority for one method or the other could be established. Spinal anesthesia has been used almost routinely for ten years in doing cesarian sections.

ANATOMY

The dissociation of the motor and sensory nerves of the uterus makes it possible to use such methods as spinal and caudal block during labor without interfering with the progress of labor. The sensory impulses are carried in visceral afferent fibers of the sympathetic system through the ganglia of the eleventh and twelfth dorsal segments. The motor impulses arise somewhere above the tenth dorsal segment. Motor and sensory nerves to the cervix and the lower uterine segment course through the parasympathetic plexuses and communicate with the second, third, and fourth sacral nerves. Somatic nerves to the vaginal canal and perineum originate in the sacral plexus. Thus it may be seen that a level of anesthesia to D-11 will block the pain of uterine contractions, cervical dilation, and vaginal and perineal distention while not interfering with contractions.

The only other anatomical consideration of note is the exaggeration of lumbar lordosis in pregnant women. This modifies the distribution of hyperbaric (heavier than spinal fluid) solutions given intraspinally in the lateral position with a change to the supine position immediately following. The level of anesthesia goes higher than desired unless the patient is put in a slight reverse Trendelenburg position.

TYPES OF SPINAL ANESTHESIA

As described by Adriani, there are five kinds of spinal blocks, if divided by spinal level:

1. *Saddle,* as the name implies, is essentially perineal analgesia with no motor changes in the legs.

2. *Modified Saddle* includes some sensory changes in the legs and a weakening, but not loss, of motor power.

3. *Low Spinal* is anesthesia to about the level of the umbilicus, with partial or complete paralysis of the legs.

4 and 5 are *Medium* and *High Spinals* with which we are not concerned here.

It is easy to see, on theoretical grounds, why the saddle and modified saddle blocks would not relieve the pain of uterine contractions, but would permit a low forceps delivery with episiotomy. This is actually the case. If relief from pain is desired, low spinal anesthesia with a level at least to the umbilicus must be obtained.

Lest the patient overhear and be alarmed by the word "spinal," obstetricians usually use the term "saddle block" rather than the more exact "low spinal anesthesia." As this is sometimes confusing to an anesthetist not familiar with the usage in obstetrics, perhaps it would be better to adopt the term "obstetrical saddle block."

TYPES OF CAUDAL ANESTHESIA

DR. RAPHAEL B. DURFEE:†

The techniques of caudal anesthesia are variations of one basic type of application of the anesthetic agent to the patient via the caudal space. There are several modifications of the original technique described for the procedure, but only the more commonly used ones will be discussed. The most generally used application is that described by Hingson and Edwards, who insert a special malleable needle into the caudal canal. This needle is connected to a metycaine ampoule by means of a sterile piece of rubber tubing, and the patient is placed on her back. Not long ago all such patients were placed on their sides following administration of the anesthetic, in order to prevent undue bending of the needle, but most observers have come to the conclusion that this makes little difference. It is generally felt that the moving of a patient with the needle in place increases the danger of needle breakage or displacement. To overcome this danger, we use special pliable catheters which are much more adaptable to obstetrical use than the malleable needle. These catheters are inserted through a 15-gauge needle into the caudal space, and are then taped into position and connected to the metycaine ampoule.

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The first use of the procedure in obstetrics was in the administration of the so-called terminal caudal procedure for anesthesia. By this is meant a single injection of the anesthetic as the end of the first stage of labor approaches, with the idea of using it as the procedure of choice during the actual delivery. Therefore, it is obvious that there is no reason for leaving an inlying trocar of any kind in the caudal canal. In the comparative studies of saddle-block and caudal anesthesia the caudal effects and results obtained with these single shot applications are the only ones truly comparable with those obtained with saddle-block. We definitely favor the use of an inlying catheter for caudal anesthesia when a long or continuous application is desired, whereas a single needle injection is more desirable for the single shot application. By either procedure, the area anesthetized is expected to be the same, although of course there will be a difference in the duration of anesthesia. The level of anesthesia will be somewhere between the umbilicus and symphysis, but while the prolonged application will afford complete relief of pain for the greater part of the first stage and all the second stage, the single application will give relief of pain in the second stage only.

PROCEDURES IN CAUDAL ANESTHESIA

When the cervix of a primipara is dilated to approximately 4 cm., or that of a multipara to 3 cm., and the patient is in good labor she is given 0.2 gm. of nembutal or seconal. Twenty minutes later she is prepared for the injection. She is placed in the prone position with the bolster directly under the hips to hold the gravid uterus off the bed as much as possible. The buttocks and sacral area are prepared with a solution such as tincture merthiolate or phemerol and the area is draped with sterile towels. The equipment is then set up, using a 200 cc. ampoule (Lilly) of 1.5 per cent metycaine in Ringer's solution. The caudal hiatus is palpated. Approximately 2.5 cc. of the solution is injected into the skin and about 2.5 cc. into the caudal canal itself. This procedure allows for painless insertion of the longer needle and also makes it much easier to be sure that the operator has inserted the needle in the proper place. The 15-gauge needle is then inserted into the caudal canal and the stylet removed.

Following this, approximately 8 cc. of solution is injected. Three minutes is allowed to pass in order that any possible untoward reaction may be noted. No injections are made at any time without trial aspiration with the attached luer in order to make sure that the needle tip does not lie within the spinal canal or a vein. If spinal fluid or blood is aspirated, the procedure should be stopped. (Fidelity in performance of this portion of the technique not only insures greater success but also immeasurably reduces the possible risk to the patient. Care at this point cannot be overemphasized.) A No. 4 catheter is then threaded through the needle to about the third mark and the needle carefully withdrawn, leaving the catheter in place. Here again, extreme care must be taken not to advance the needle while the catheter is threaded through it or to pull the catheter out of the needle, for either could shear the catheter tip off against the sharp bevelled edge of the needle tip, leaving a portion of the catheter in the patient's body. These precautionary measures are not hard to follow when one becomes used to the technique.

The catheter is then taped in place and carried around to the patient's abdomen where, by means of a No. 23 needle, it is attached to the tubing leading from the ampoule of metycaine. As this is being done the patient is carefully rolled to her back and the bolster removed. Approximately 200 cc. more of solution is injected through the catheter. The patient is placed in semi-Fowler's position. Then the level of anesthesia is determined, the patient's blood pressure is checked, the fetal heart is auscultated, and a rectal examination is done to determine the progress of dilation. At this stage the patient has had a total of 30 cc. of metycaine. If the blood pressure drops below 80 mm. of mercury systolic, it may be easily raised by an injection of 0.5 or 0.25 cc. of neosynephrine. The fetal head may be a little higher than is normal, because of the patient's position over the bolster during the administration of the injection, but this will soon correct itself.

Additional amounts of the anesthetic agent may be given easily when the pain-relieving effect of the anesthetic diminishes, and should be given at the first complaint of discomfort. Usually 20 cc. is sufficient to continue adequate relief of pain for an hour or more. The solution is injected through the catheter by means of the syringe and stop-cock attachments connected with the metycaine ampoule. It is not necessary to move the patient again except to adjust the bed so that she is supine while the injection is being given and restored to the semi-Fowler's position when it is completed. By this means the first and second stages of labor may be conducted satisfactorily for some time.

DR. SCHAUPP:

Equipment needed for spinal anesthesia in obstetrics is the same as is needed in the administration of spinal anesthesia for any purpose. In our series we have been using "heavy Nupercaine," which is 5 mg. of Nupercaine in 2 cc. of 5 per cent glucose.

Time of injection—The time should be gauged so that while relief of pain is provided for as long a time as possible during labor, adequate anesthesia remains for the delivery. It varies with the agents used for anesthesia, the parity of the patient, and the progress being made in labor. In general, it may be given to a primigravida when the cervix is a rim, and to a multipara when the cervix is dilated to 6 cm. and good progress is being made. If the anesthetist knows the probable duration of anesthesia, by estimating the duration of labor remaining he can gauge the time for injection. We have found that 2.5 to 5 mg. of Nupercaine will last two and one-half to three hours. If anesthesia wears off too soon, however, a second injection may be made. One patient in our group received three injections before the child was delivered.

Analgesia during the first stage of labor, before the spinal injection is given, is obtained in the usual case with Demerol 100 mg. hypodermically once or twice, and Nembutal 0.2 gm.

Achieving a Level—All the lumbar interspaces have been used as the site of injection. We use the fourth, since it is the one with which most anesthetists are familiar and a good level of anesthesia can be obtained.

There are many ways of achieving a level in the hands of trained anesthetists, but the obstetrician is interested in a standardized, simple procedure which will produce the desired result. The one currently popular is to use solutions of anesthetic agents heavier than spinal fluid (hyperbaric) in the sitting position, and to give the injection rapidly in 2 to 3 seconds. The patient is held upright by an assistant for 30 seconds. She is then laid flat with her head up on a pillow to prevent the solution from reaching vital centers in the medulla if by chance it should go up. A common error is to give the injection too slowly, with the result that the solution is pooled low in the spinal canal. This gives a true saddle block, but will not relieve labor pains. The injection should not be given during a uterine contraction, as currents set up in the spinal fluid by the contraction carry the anesthetic to a dangerously high level. Too rapid injection, too much solution, and the Trendelenburg position all may give high levels. When the procedure is properly done, the level of anesthesia reaches the umbilicus and the pain of uterine contractions is relieved completely. Motor power may or may not be present in the legs; the sphincter ani is relaxed. The relaxation and relief from pain seem to affect the cervix by allowing it to dilate more rapidly and thereby shorten labor.

Drugs Used—Varying amounts of many drugs have been reported by different authors. Following are some common doses: Procaine 50 mg. (crystals) in 2 cc. of spinal fluid. Metycaine 22.5 mg. (1.5 cc. of 1.5 per cent Metycaine used in caudal injections). Pontocaine 5 mg. (mix 2 cc. of 10 per cent glucose with 2 cc. of 1 per cent Pontocaine solution. Discard all but 1 cc.) Nupercaine 2.5 to 5 mg. (1 or 2 cc. of solution which comes already mixed with 5 per cent glucose.)

Mixtures of drugs with adrenalin or ephedrine are now being used successfully to prolong anesthesia, but we have had no experience with this in the obstetrical department.

DELIVERY

In the usual case, delivery is accomplished with forceps. They are used to lift the head over the perineum since the bearing-down reflex is abolished by the spinal or caudal, and the head rests there until the block wears off. Occasionally, delivery can be accomplished spontaneously over a relaxed perineum or with a deep episiotomy, but the patient must bear down voluntarily or fundal pressure must be used. Rarely, with exceptional uterine contractions, the baby may be delivered with no other assistance. If the patient is in bed, and alone in a room, she may not know what is occurring, and the baby can be lost. For this reason, patients in whom dilation is complete should be checked frequently.

The incidence of the need for rotation of the baby is higher than in ordinary deliveries, but the rotation is easily accomplished owing to the relaxation of the soft parts of the perineum and the levator ani muscles. This relaxation, incidentally, may explain the failure of spontaneous rotation in many cases. If a second stage of one hour is allowed, usually the head will rotate and descend to the perineum. Breech delivery may be accomplished with the patient under spinal or caudal block alone, but if intra-uterine manipulations are required a deep anesthesia by ether may be necessary to relax the uterus. Podalic version of the infant should probably not be attempted with either saddle or caudal block alone.

Episiotomies are done routinely on all primigravidas, and on all multiparas who need it. The infants usually cry as soon as the head clears the perineum, and as there is no interference with uterine contractions, blood loss is minimal.

Dr. Durfee:

Obstetrical Advantages—The advantages of obstetrical anesthesia of this type are numerous:

1. Complete relief of pain throughout the first and second stages of labor.
2. Absence of need for additional anesthesia.
3. Shortening of the first stage of labor.
4. Exercise of control in operative obstetrics.
5. Facilitation of all operative obstetrical procedures.
6. Provision of a previously established anesthesia for most obstetrical emergencies and any procedures that may arise for taking care of them, including cesarean sections.
7. Delivery without the influence of narcotic drugs or inhalation anesthesia. (For this reason it is especially recommended for delivery of premature infants.)
8. Less loss of blood.
9. Prevention of excessive tension against the cord in a situation where the cord is short or foreshortened by malplacement around the fetal head.
10. Prevention of birth trauma to maternal tissues by allowing for complete relaxation of the tissues of the birth canal.
11. Reduction of the incidence of precipitate deliveries.
12. The patient is happy, awake, and in excellent physical condition.
13. Preservation of uterine tone and prevention of third stage uterine atony.
14. Ease of early artificial rupture of membranes.
15. Use in patients in heart disease, general debility, pulmonary diseases, upper respiratory infection and toxemia of pregnancy.

16. Improved morale of patient, staff, and relatives.
17. Ease in diagnosis of dilation and of the position of the fetal head.
18. Allowance for prolonged second stage without undue effect on baby or mother.
19. Shortening of postpartum convalescence.

SPINAL ANESTHESIA IN CESAREAN SECTIONS

DR. SCHAUPP:

Spinal anesthesia has been used for cesarean sections at Stanford University Hospital for many years with most satisfactory results. The injection usually is given with the patient in the lateral, slightly reverse Trendelenburg position to prevent too high a level. Many drugs have been used, but at present the anesthesia department usually uses Pontocaine in doses of from 5 to 15 mg. weighted with 10 per cent glucose, the variation depending upon the views of the individual anesthetist. Ephedrine 50 mg. hypodermically is given routinely.

CAUDAL ANESTHESIA IN CESAREAN SECTIONS

DR. DURFEE:

We have used the caudal technique for cesarean sections, but not as often as spinal anesthesia nor with as great over-all success. In most instances the caudal was started for what appeared to be normal labor. Some patients required accessory anesthesia because of incomplete relief of pain, but in many cases nothing additional was needed but oxygen for the child. In giving a caudal anesthetic for cesarean section the best method is to give it 30 to 45 minutes before operation to insure a proper level of anesthesia. This often requires 10 to 15 cc. more as a total dose than is needed for normal delivery. If the operative procedure should be prolonged, the advantage of continuous application is obvious. On the whole, for routine elective cesarean sections spinal anesthesia is preferable to caudal because of simplicity of technique.

COMPLICATIONS AND CONTRAINDICATIONS

DRS. SCHAUPP AND DURFEE:

The most important added consideration in both spinal and caudal anesthesia is the presence of the fetus, which is susceptible to prolonged hypotension and to anoxemia. A systolic blood pressure of 80 mm. of mercury in the mother is considered necessary to prevent fetal distress, as it takes this much pressure to maintain adequate circulation for the placenta. Consequently, a careful, regular check on the mother's blood pressure is necessary following the injection. Treatment for hypotension consists of the administration of Neosynephrine 2 mg. hypodermically, or ephedrine 25 to 50 mg. hypodermically. Elevation of the legs to put pooled blood back into the circulation is resorted to in extreme cases or emergencies, with care taken not to raise the level of anesthesia above that normally allowed by spinal injection. In our series the incidence of hypotension requiring treatment was 17.3 per cent in the cases in which spinal anesthesia was used, and 12.9 per cent in the patients given caudal anesthesia.

The level of anesthesia must be checked, as a high level will paralyze the muscles of respiration and may cause anoxemia. As the fetus may be affected by anoxemia in the mother, permanent damage to the baby can result. The fetal heart reflects such changes by changes in pulse rate, usually a slowing. Pulse rates of 80 to 90 per minute are not unusual. The same phenomenon is observed in the case of hypotension. Response to adequate oxygenation or raising the blood pressure of the mother is usually prompt. Deep breathing, pure oxygen, and artificial respiration are used — in that order — when necessary.

In giving an anesthetic by the caudal route, care must be taken against massive intravenous injections. As a precautionary measure, aspiration should be done before the solution is injected. If spinal fluid appears, it is best to abandon the procedure. If blood is aspirated readjustment of the needle usually will correct the situation and permit going ahead with the procedure.

Headaches in the postpartum period usually occur in 8 to 10 per cent of the patients given spinal anesthesia. The incidence in our series has been 8.68 per cent. Headache usually appears on the second or third day and is not very severe, lasting only 24 to 48 hours. Treatment varies greatly, no one remedy being entirely satisfactory.

Bladder dysfunction (residual urine and inability to void) may occur in postpartum patients who have received neither spinal nor caudal anesthesia, but the incidence is higher when these methods are used. In our series, it was 0.86 per cent in patients who had had caudal, and 6.5 per cent in those who had had spinal anesthesia. Recently the incidence of bladder dysfunction has been lower as a consequence of improved technique. In none of the cases was the hospital stay prolonged because of this complication. Treatment consisted of catheterization as necessary or continuous drainage through an inlying catheter and chemotherapy given prophylactically.

Neuropathy may occur following spinal anesthesia, and since the damage may be in the central nervous system, it may be permanent. Damage to the nervous system that may be caused by giving a caudal anesthesia, on the other hand, will affect only peripheral nerves and will usually clear up.

Contraindications to the giving of either caudal or spinal anesthesia include diseases of the nervous system, sepsis, spinal arthritis, skin infection near the site of puncture, shock, long-standing headache (this applies to spinal anesthesia only), and idiosyncrasy to the drugs used. Patients with hypertension must be watched with extra care as the fall in blood pressure may be excessive, and the response to pressor drugs more rapid and extreme than desired. A pilonidal cyst, whether it has been operated upon or not, is considered an absolute contraindication to caudal anesthesia. The prospect of long, difficult labor should make one not too familiar with these procedures hesitate to use them except for the delivery itself. Given too soon, particularly if labor is desultory, either caudal or spinal anesthesia can inhibit labor.

COMMENT

For the average practitioner, anesthesia by spinal injection is the procedure of choice. He is familiar with it, as is the staff of his hospital. Relatively little study and practice are required to apply it in obstetrics. The patient is awake at the time of delivery and the infant is not under the effect of the anesthetic agent. Patients appreciate being awake to hear and see their offspring immediately.

For the patient, caudal anesthesia is the procedure of choice. It can be maintained for about 12 hours and therefore can be given earlier in labor. This decreases the amount of other medication necessary in the first stage of labor. The procedure does not cause headache. If neuropathy should occur, the chance of recovery is excellent since the anesthetic agent is applied only to the peripheral nerves. The advantages in delivery are the same as for spinal anesthesia.

Finally, it must be remembered that, in either procedure, someone familiar with the procedure, with the complications that may result, and with the treatment of them must be in constant attendance after the anesthetic agent is injected.

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California Cancer Commission Studies*

Chapter X

Skin Cancer

Henry J. Ullmann, M.D., *Santa Barbara*

In 1943 the number of deaths reported from cancer of the skin was 3,273 in the registration area of the United States—a shocking figure in view of the fact that cancer of the skin is highly curable when treated properly in a reasonably early stage. Some of these deaths could have been prevented by the proper care of precancerous lesions, thus preventing the development of cancer, others by prompt diagnosis and the institution of proper treatment. Physicians must recognize that there are a number of conditions of the skin in which cancer is more likely to develop than it is upon normal skin, and they must suspect cancer when anything unusual develops. These conditions have been called "precancerous dermatoses."

The following are some of the skin lesions or conditions in which cancer is likely to develop eventually:

Farmers' or sailors' skin is found on the exposed areas of skin. It is found only in adults and more commonly in later life among those who have had years of exposure to sun and wind. Persons with red or sandy complexion and those with skin that burns easily and does not tan or is excessively dry are especially prone to the disease. The skin is dry and frequently parchment-like with white sclerotic areas. In some instances the appearance closely simulates that of chronic radiation dermatitis. Keratoses are common, and sooner or later epitheliomas develop in some of these keratoses, or independently on other areas. Multiple epitheliomas are not uncommon, but fortunately many are of a low grade malignancy and grow slowly. There is degeneration and atrophy of greater or lesser degree in the upper layers of the skin, and the epidermis shows atrophy except where keratoses are developing.

Treatment consists in protection against sun and wind and the use of oily creams. Mineral oils may serve as protection, but are of very little use in actually softening the skin. Animal oils and waxes (neatsfoot oil, lard, lanolin) are the most penetrating and effective, especially when incorporated in a cream containing a wetting agent. The next most effective are the vegetable oils, especially olive oil. A very effective treatment, in addition to the oily creams, is the use of massive doses of Vitamin A—200,000 to 300,000 units a day. Immediate improvement must not be expected, but a definite change for the better will be noticed in six to eight weeks. Then the dose may be reduced gradually over months, until a dose of 50,000 to 100,000 units is reached, and this continued for several years or until the physician decides no further improvement can be expected. The daily dose may then be reduced to 25,000 units and continued indefinitely, except in those cases in which the skin shows signs of recurring deterioration. In that event the dose must be increased to a point where the skin again shows improvement. Keratoses and epitheliomas must be treated promptly as they appear, but radiation in the treatment of lesions on skin of this type must be used with great caution, if at all.

Keratoses are the most common lesions preceding cancer of the skin. Senile keratoses are most frequent on the exposed surfaces and most common in the older age groups, although they are occasionally found in the 30-40 age group. They are rarely seen in Amerinds, Arabs, or Negroes. They usually appear on skin showing signs of senile degeneration and vary in size from a millimeter to several centimeters. Often multiple, they may be, in the early stage, only a thickened, firmly adherent, horny scale, varying in color from greyish through brown and yellow to reddish. Scales are frequently shed only to reappear, and the patient will often say that it has "cleared up" repeatedly and recurred due to this scale shedding. Not infrequently, a warty hyperkeratosis will form, and such lesions are often called warts by the patient. This growth may indicate a carcinomatous change, but in many instances the change to cancer is so insidious that it infiltrates widely before extending above the skin level.

Keratoses are the most dangerous, common and typical of the true precanceroses. The slightest suspicion of malignant change calls for biopsy before planning treatment. They are particularly dangerous when they develop on the mucous surface of the lips or at a mucocutaneous junction. Basal, squamous or mixed basal and squamous cell cancer may develop.

The treatment is largely a question of good judgment. As they so relatively frequently develop into cancer, it might be wise to destroy all such lesions in patients in the lower age brackets. In old persons with multiple lesions, it is probably better practice to keep them under close observation and treat only those lesions that show active growth or a suspicion of developing cancer. For these lesions, such a course is usually safe because of the usual slow development and growth of cancers of this kind. However, the entire group should be treated medically as outlined before.

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*Organized by the Editorial Committee of the California Cancer Commission.

Note by Editorial Committee: Dr. Ullmann was requested to write this chapter because of his extensive experience in radiological treatment of skin cancer. A committee of dermatologists, consisting of Dr. H. J. Templeton, Dr. Samuel Ayres and Dr. Nelson Anderson, has been preparing an illustrated article on "Skin Neoplasms" for the California Cancer Commission Studies.

Thorough desiccation is a satisfactory treatment for the majority of such lesions, although it leaves a scar. Freezing, trichloracetic acid or phenol may be used for very superficial lesions, but if they recur they should be desiccated rather than refrozen. Radiation, either x-ray or radium, has been recommended, but this is dangerous unless biopsy has shown the absence of cancer. The dose required to removed a moderately thick keratosis is an appreciable fraction of that required for treatment of cancer, and tissue once irradiated to that degree may not tolerate the further dose required if cancer should appear in the area later. A good rule to follow is: *If there is any suspicion or presumptive evidence of cancer, the lesion should be treated as a cancer unless a biopsy has been taken and the lesion proven benign.* Any of these lesions may be excised and the tissue removed submitted to a pathologist. None of these lesions occurring on mucous membranes or at mucocutaneous junctions should be watched for developments. They should be destroyed at once.

Seborrheic keratoses are potentially less dangerous than the senile varieties. They show great variation in size (a millimeter or less to several centimeters) and are sharply circumscribed. The thickness varies from a slight elevation above the surrounding skin to several millimeters. They are firm and rubbery rather than hard. The surface varies from smooth to verrucous, and the color from a dark or brownish yellow to a brownish black. Some, especially on blondes, may be yellower or greyer than the surrounding skin. Many have a distinctly greasy appearance. They are most common on the trunk, and some individuals may be literally peppered with them. While occasionally seen on the young, they are more common on the elderly, but not at all uncommon in persons of middle-age with fair skin who spend hours sun bathing. Single lesions are frequently seen. They may simulate some form of non-hairy pigmented nevi—the nevoid keratoses.

True seborrheic keratoses need not be destroyed except for cosmetic reasons, but should be examined periodically for signs of malignant change.

Desiccation is the most commonly used method of removal, although excision is frequently done. X-rays or radium should not be used. Freezing is satisfactory for thin lesions, but the treatment may have to be repeated.

Arsenical keratoses will follow the use of arsenic in susceptible individuals, no matter how it is given, even in small doses over a long period of time. They are most common on the palms and soles, but may be generalized and accompanied by wide pigmentation over the trunk. Excessive dryness of the palms and soles, with miliary or larger, deep-seated keratoses peppered over them is typical. Occasionally the lesions may be large and thick. These larger ones are very apt to become malignant eventually and require the treatment given for other skin cancer. However, many years after exposure to arsenic usually elapse before actual cancer appears. If large, these lesions should be treated as senile keratoses. Lanolin or similar ointments should be applied frequently to the smaller lesions and the surrounding skin.

Industrial keratoses, found at times on patients handling certain tars and dyes, should be treated as are arsenical keratoses, for they, like the arsenical keratoses, are more likely to develop malignant change than are the common senile form.

Leukoplakia is listed here only because it occasionally occurs on the penis, labia minora and labia majora. It is most common on the lips, tongue and buccal mucous membrane, and therefore treatment of it will be discussed in the section on lips, mouth and tongue.

Chronic radiation dermatitis is one of the most distressing conditions with which a physician has to deal. It resembles an aggravated form of senile or sailor's skin as well as xeroderma pigmentosum. It is, unfortunately, of somewhat common occurrence and may not appear until years after the irradiation injury. The eventual development of squamous cell cancer in the affected area is all too common. Many of the pioneer workers with x-ray have died from cancer developing in these areas. The best treatment, when feasible, in aggravated cases is excision of the area, followed by plastic repair. The milder or earlier cases may be treated with aloes vera or radon ointments. In no instance, with the exception of radon ointment, should any form of irradiation be used in the treatment; occasional use of ultraviolet radiation in treatment is a pernicious practice. Individual keratoses may be removed by thorough desiccation as they appear. Local applications must be bland and soothing, such as neatsfoot oil, lanolin, zinc oxide or boric ointment. Ointments containing essential oils which are stimulating as well as antipruritic, such as calmitol, must *not* be used. Where there is only atrophy of the skin, dryness and telangiectasia, no treatment is required, but frequent careful inspection must be made for keratoses and developing cancer. The patient should be told to avoid overexposure to sunlight and ultraviolet treatments on involved areas, and to avoid any but bland, oily creams, if creams are desired for excessive dryness of the skin. Chronic ulcers should be excised and the site repaired.

Cutaneous horns, although usually found in the elderly, may be seen in children. When the horns are large or of long duration, *the presence of cancerous change in the base must be suspected.* Excision of these lesions is preferable. Radium and the x-ray have been used, but as the objection to them for this purpose is the same as in the case of senile keratoses, a biopsy should be done before treatment so that an adequate dose can be given if the lesion is cancerous.

Scars: While cancers developing in scars are frequently seen, the percentage is obviously low. When cancer is found, it is usually of squamous cell structure and in scars of 20 or more years' duration. Large scars should be thoroughly examined at yearly intervals for changes that suggest a beginning cancer. Any suspicious area should be biopsied and, if cancer is found, the entire scar, when possible, should be excised and plastic repair done.

Moles and Nevi: These lesions are becoming more and more important because of the public's increasing awareness of the danger of a "black mole"; and naturally laymen do not always differentiate between a melanoma and an ordinary brown mole or an angioma. Nevi, moles or "birthmarks" occur in large numbers and great variety and, fortunately, the great majority are harmless or rarely become malignant. As there is hardly anyone who does not have at least one mole, the percentage of cancer developing in such lesions must be low. However, malignant changes do occur in them sometimes, and the lesions comprise a great variety of malignant types and degrees of malignancy.

There is hardly a physician who has not seen the highly malignant and widely metastasizing malignant melanoma that has developed in a pigmented mole, even the smallest, either spontaneously or from improper treatment, irritation or trauma. And yet the relatively benign basal cell cancer may also develop in a mole, and a sarcoma has been reported developing from a verrucous nevus. It must be remembered that a *malignant melanoma may develop from a non-pigmented lesion, as well as a pigmented one, so the absence of pigment is not an indication that the lesion may never become malignant.* A lesion need not be clinically evident at birth to be a mole, with or without nevus cells. Only by pathologic examination can a lesion be identified as a true nevus—that is, containing nevus cells. The presence or absence of these cells does not affect the potential danger of future malignancy.

The common mole, from a few millimeters to a centimeter in size, is not usually dangerous unless subjected to repeated irritation, trauma or improper treatment over a considerable period, usually years. Large lesions, brown or brownish black or chocolate colored, with or without hair, seldom become malignant, although malignancy does occasionally develop, especially in moles subject to irritation. The author observed one case in which malignant melanoma developed from a mole when the patient reached the age of 20, without a history of trauma or irritation. When malignancy develops in moles or nevi, it is generally at or after adolescence. For that reason it would seem wise to remove all such lesions, by *wide excision down to the underlying fascia,* whenever this is possible, before adolescence. This is especially necessary where the lesion is at a site subject to trauma, such as hands, feet, belt-line and collar line.

The most dangerous lesion is the so called "blue-black" mole. It may occur anywhere on the body and be overlooked when it occurs between the toes, under a nail or behind an ear. It varies in size from a millimeter to nearly a centimeter, and it may be flat and level with the skin or considerably raised. The surface is smooth and, not infrequently, shiny. In some of the larger ones the surface appearance is that of a juicy or pulpy material under a somewhat translucent pellicle. The author considers this appearance presumptive evidence of malignant change although he has removed one such lesion that was reported non-malignant. All others removed, however, were reported as highly malignant. *Improper treatment, that is, anything short of wide excision to fascia, will often cause these blue-black lesions to explode into cancer.* While some grow actively as cancer for a time without metastases, metastasis is generally widespread before malignant change is recognized in the primary lesion, and the first indication of such change is the discovery of metastasis in a regional lymph node.

While it is true that an experienced dermatologist can usually differentiate between small common moles that may be desiccated with safety, and dangerous or potentially dangerous lesions, it cannot be said in general that the treatment of moles by desiccation is an entirely safe procedure. Many lesions have exploded into highly malignant metastasizing cancer following such treatment of what was considered a harmless blemish.

Surgical excision with adequate margin is always safe, and the only method that can be recommended as a general procedure.

Neither x-ray nor radium should be used in the treatment of moles.

Chronic ulcers that have existed for a long period without any tendency to heal must be watched for the first suspicious sign suggesting cancer, as squamous cell cancer has been reported in deep burns, decubitus ulcers and varicose ulcers, ulcers in pellagra, and traumatic ulcers in legs where there was poor circulation and scleroderma. This also applies to chronic fistulas.

Biopsy should be done at the first suspicious change in the appearance of a chronic ulcer or sinus, and if cancer is found, appropriate operation is indicated.

Kraurosis vulvae is usually found in elderly women or at the menopause, but it has been observed in younger women following surgical castration. The first evidence of the disease is usually the appearance of small, reddish areas near the ostium vaginae, frequently with severe itching. These spots become depressed and sensitive to touch and later there is narrowing of the ostium due to loss of tissue elasticity. The natural folds become obliterated and the surface thin, somewhat translucent and glossy, dry or moist. With further progress of the disease, either symmetrically or irregularly, both labiae may be practically obliterated and thin; they may be somewhat translucent or may change to thick and opaque. The color varies from white to pearly, reddish pink to bluish. Leukoplakia is not uncommon. Squamous cell cancer may follow, especially where leukoplakia is present, so that the lesions should be examined regularly at least every six months.

Mild antipruritics may be used to alleviate the itching when present. Amniotin suppositories have been found of considerable value in some cases. X-ray, in small doses, has been used to relieve the itching, but must be used with judgment and strictly limited. Radium has been reported successful in the treatment of small areas of leukoplakia. When ulcers, erosions, vegetations, warty keratoses and nodules occur, they should be excised and small areas thoroughly desiccated. Otherwise, treatment should be conservative. Vulvectomy, followed by plastic repair, may be necessary where there are large areas of leukoplakia, erosion or ulceration or the signs of beginning cancer. The primary duty of the physician is to keep the patient under careful supervision so as to be able to act promptly at the first suspicion of malignant change.

SKIN CANCER

The most common cancers of the skin seen in everyday practice are the basal cell, squamous cell (epidermoid) and the mixed basal and squamous cell growths. They are all classified under the name "epithelioma" and the term epithelioma denotes a malignant lesion. Although an experienced observer may make a good guess as to whether a specific lesion is a basal or squamous cell cancer, biopsy may reveal that what was though to be a typical basal cell cancer was a highly malignant squamous cell cancer. On chance and probability, a guess that a lesion on a nose is a basal cell and one on an ear is a squamous cell will give a high percentage of correct diagnoses for the simple reason that these lesions are more common at these locations. Nevertheless, biopsy of epitheliomas is important to determine the diagnosis, treatment and prognosis.

Many epitheliomas of the skin have been named after the "exciting" cause—sun or actinic cancer, chimney-sweeps' cancer, kangri cancer, occupational cancer—but as discussion of these varied cancers belongs in a monograph or textbook, only the points that are pertinent to the objects of this presentation will be taken up.

The development of epitheliomas in the precanceroses has made the proper treatment of these lesions a major factor in the prevention of cancer. It is of still greater importance to be able to recognize cancer as early as possible in order to institute the proper treatment while it is curable; and the cure rate for cancer of the skin, in a reasonably early stage, is as great as or greater than that of any other important disease that a physician is called upon to treat.

Epithelioma of the skin, while usually seen in those of advanced years, has been reported many times in adolescence and even in childhood. It is not too uncommon in young adults with fair or sandy complexion who are continuously exposed to sunlight and hot, drying winds—the so-called sun or actinic cancer. The average age, however, has been given as about 52. The disease is more common in men than in women in the ratio of about 70:30, and it is the opinion of the author that this is, at least partly, due to the fact that women, as a class, grease their faces whereas men do not. In the author's experience, most of the cases in women are among those who live on ranches where they are exposed to sun and wind and who say that they have never used creams or similar cosmetics. Cancers of the skin are rare in Negroes, and less common in persons with dark, oily skins.

Epitheliomas are most common about the head and especially the face, but are found anywhere on the body and may be single or multiple. Many, especially the basal cell cancers, grow slowly, but some may appear as suddenly and grow as rapidly as a granuloma pyogenicum, with which they may be confused. In the author's experience the history of lesions, proven by biopsy to be cancer, may be as short as six weeks to as long as 18 years. Such lesions vary greatly in appearance. An epithelioma may be a symptomless, semi-translucent nodule, a patch that simulates eczema (even to the itching), a crateriform or umbilicated keratotic lesion with a rolled, waxy margin, a flat keratosis with adherent scale that bleeds when scale is removed (a keratosis may do the same thing) or a shallow or deep ulceration. It may have the appearance of a whitish scar with small (sometimes only a millimeter) firmly adherent keratotic crust or scales with the intervening tissue suggesting advanced scleroderma. A sign highly suggestive of cancer in these lesions is a varying degree of telangiectasia. To the palpating finger, the lesion may be nodular or infiltrating. In some, relatively innocent in appearance, a distinct plaque may be felt in the skin and, under magnification, a fine waxy, rounded edge may be seen at the margin of the induration. This margin may also be seen without palpable induration.

Any lesion may show alternate periods of quiescence or even of slight regression and moderate or rapid growth. A common statement of a patient is that the spot had healed repeatedly only to recur, each time a little larger, and that this "healing" was the reason for not seeking advice earlier. The entire lesion may consist of a dark red or maroon-colored, smooth, sharply defined lesion which is commonly diagnosed as a dermatosis, frequently as psoriasis if scaling is present. If any such lesion persists and is recalcitrant to treatment, biopsy must be done to supply the diagnosis. If patchy scarring occurs, such lesions may be mistaken for those of lupus vulgaris or syphilis. Cauliflower-like fungating lesions are not uncommon, and many lesions are verrucous, simulating a senile wart or keratosis. This latter type is frequently on the hands. Any lesion may show papillary areas, or the entire lesion may be papillary. The cauliflower lesion is of this type.

A basal cell or mixed basal and squamous cell cancer may contain pigment with the color varying from brown to black, or there may be one or more miliary spots of black or chocolate. Some of these growths simulate melanoma very closely; in the author's experience, biopsy reports of two lesions, clinically the same, showed one to be "pigmented basal cell cancer," the other "malignant melanoma." *Pigmented lesions should not be biopsied but excised.*

The only safe rule to follow is to regard suspicious lesions as cancer and to take a biopsy specimen, except that in the case of moles wide excision should be done.

Cancer of the skin is highly curable if treated adequately. "Adequately" means thorough removal or destruction by excision or cautery or by irradiation (x-ray—radium). A high percentage of cures may be expected from either of these methods, and the method of choice is that which is easiest for the patient and leaves the least scarring. For example, a lesion on the face which would require extensive repair or cosmetic operation following surgical removal may be treated by irradiation with minimum scarring and expense to the patient, while a similar lesion on the arm or trunk may be excised, leaving a negligible linear scar. The treatment of all lesions by any method must include a wide margin of normal tissue both on the surface and in depth beyond the lesion.

It must always be remembered that *the object in treating any cancer of the skin is to remove or destroy all of it, without regard to the resulting scar.* Less than this is, without exception, disastrous to the patient.

LYMPH NODE METASTASES

Metastases to the regional lymph nodes are not common from malignant lesions of the skin except from melanomas and squamous cell cancers. When metastasis occurs, however, especially from melanomas, the situation is extremely serious. Basal cell cancer of the skin very rarely metastasizes, and while such metastases have been reported, these lesions are generally considered to spread by contiguity only. Squamous cell cancers of the skin will metastasize to the regional nodes, usually after a long period of time. Mixed basal and squamous cell tumors should be considered as squamous. Melanomas may metastasize long before malignancy is suspected.

The treatment of metastasis from cancer of the skin to the regional lymph nodes is essentially the same as that for treatment of metastasis from cancer of the mucous membrane—surgical removal in the operable cases after the primary lesion has been completely controlled, and irradiation (x-ray or radium) in the inoperable cases. Each case is a separate problem to be judged by consultation between the surgeon and radiation therapist. In the absence of metastasis, treatment of the nodes is ordinarily not undertaken.

Malignant melanoma, because of its highly malignant propensities, constitutes a different problem. Here it is generally felt that complete dissection of the nodes should be performed even if metastases are not thought to be present. In such cases, the primary lesion should be removed a few weeks before the node dissection on the assumption that nodes will screen out malignant emboli which might be expressed into the lymph channels at the time of the removal of the primary lesion. The nodes will thus filter these metastases and hold them before spread to the next link in the drainage chain. When the primary and secondary site are operated upon at the same time, without removal of the intervening tissue, recurrences are fairly commonly noted in the tissue between the primary and secondary locations. It is probably better that the primary lesion and involved nodes be removed in continuity wherever possible, as there may be tumor cells in the channels in the intervening tissue. Again it must be emphasized that irradiation has little, if any, effect on malignant melanoma.

SUMMARY

The prevention or removal of precancerous lesions is a method of preventing cancer of the skin.

In event of doubt as to the malignancy of a skin lesion, biopsy should be done *except* in the case of pigmented lesions, which must be excised to fascia with a good margin. Material from pigmented lesions excised may be examined microscopically for indications as to prognosis.

Irradiation is *never* to be used as a treatment for pigmented lesions.

Basal or squamous cell cancers of the skin may be treated by adequate operation or adequate irradiation with every expectation of cure if the treatment has not been delayed. Other methods are also employed with success. The cure depends upon the adequacy of treatment.

"Cancer of the Cervix Uteri" by H. F. Traut, M.D., and "Cancer of the Corpus Uteri" by H. N. Shaw, M.D., Chapters XXXII and XXXIII of the California Cancer Commission Studies, will be published in this section of the April issue of CALIFORNIA MEDICINE.

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EDITORIALS

Ten Years After

Periodically in the lives of men there comes a time for taking stock, for reviewing actions previously taken and assessing their worth. The best known example of this process in American history is the Gettysburg Address delivered by Abraham Lincoln in words which beggar description and defy emulation.

The time has now come for California doctors to take an appraising look at their own ten-year-old child, California Physicians' Service. The words may not come out as did Lincoln's but the retrospective approach is the same.

California Physicians' Service was organized by an aroused medical profession during days of depression, days when the average man didn't have the dollar which would have bought so much in the glutted marketplace. Goods and services were plentiful but the bridge between offering and selling was a tortuous affair with a narrow approach. Desire to buy and sell existed on both sides but the medium of exchange was absent. The economics of the time drove home to the physicians of the state the sociological problem which they had been studying for more than twenty years. Doubtless the presence of more time for thinking contributed to the arrival at the concept of C.P.S.

C.P.S. was formed late in 1938 and started operating early in 1939. Based on the desire of the doctors to provide a budget basis for the average wage-earning family for the purchase of medical and hospital care, the plan provided that the doctors themselves must be the underwriters. The financial risk was on the shoulders of the profession, not the public. The doctors agreed to give their services and to accept in exchange whatever funds might be available to pay them. Meanwhile, the public was guaranteed service.

Now, ten years later, the time has come to look over the results of this frankly experimental program and to reexamine the initial concept. Physically, C.P.S. has grown from nothing to a beneficiary membership of more than 700,000, and the growth continues. The physician members have reached a total of some 9,500 and the number is increasing daily. The organization has grown from a standing start to a business office of 517 employees.

Financially, C.P.S. has repaid its original loan from the California Medical Association, has met its bills and has accumulated $835,435 in its unit stabilization, or reserve, fund. It serves as trustee for more than $1,000,000 monthly in incoming and outgoing funds.

Morally, the progress is even greater. C.P.S. has served as a beacon light for other states. As the first statewide medically-operated prepayment medical care plan, it has set an example which has been widely followed as the proof of the pudding. Other states have studied the C.P.S. form of budget-basis medical care and have found it good. Many have followed its plans and policies and others have adapted them to their own peculiar needs. Today there are comparable plans operating in 42 states.

On top of that, C.P.S. has proved to the people of California that top grade medical care is available on a budget basis through voluntary enrollment. Not only through its own activities but also through the inauguration of other prepayment plans, C.P.S. has been in the forefront of the movement to acquaint the people of California with the knowledge that the best in medical service can be had by the average man at a cost he can afford. Here is a true extension of medical care for the benefit of the people, sponsored by the doctors themselves and operated without governmental regulation or interference with either recipient or provider.

These accomplishments have not been gained without a struggle. There have been many dark days for C.P.S., days when both the beneficiary and the physician members have doubted the wisdom of the original plan. There have been moments of doubt in the minds of even the staunchest physician supporters of the program—but let it be noted that this doubt came not from the philosophy of the program but from the apparently unreceptive attitude of others. There have been threats of withdrawal from the service. There have been actuarial problems, arising out of the inability to provide the best in service at the least in cost. There have been attacks from politicians who would use the experience of C.P.S. as the foundation for inspired plans to set up a state monopoly to regulate all medical care.

These doubts, these threats, these attacks have been weathered. C.P.S. has continued to operate, to grow, to serve. Its increasing enrollments tell the story with eloquent clarity. Its roster of physician members reflects its acceptance by the profession. Admittedly C.P.S. is still a pilot plant. But, administered by physicians, it has repeatedly met changing conditions with a flexibility not to be expected of a government bureau, meanwhile keeping its eye on the original goal of public service.

A child of ten normally rates a birthday cake with ten candles. California Physicians' Service is this child and the cake and candles are here in the minds of the people of California. The first ten years have produced a sturdy, healthy, progressive child: the next ten may be expected to see a continued growth along the same line. In retrospect the progress looks awfully good; in prospect we can see everything to make us proud and to warrant the retention of the program of the founders.

* * *

The A.M.A. 12-Point Program

Kicking off its new public relations program, the American Medical Association has announced a 12-point plan for the extension and improvement of medical care for all the American people.

Announcement of this program, which will be found elsewhere in this issue, at a meeting of representatives of all state medical associations in Chicago on February 12 brought forth a cheer from the audience. Here, at last, was a concrete, progressive, positive program adopted by the national organization in furtherance of the aims of the Association and for the benefit of the American public. Critics of the A.M.A., including, unfortunately, some former prominent A.M.A. officials, hastened to decry the program as window dressing for a sinister campaign of lobbying and propaganda; officials of the state medical associations, those who will carry out the nationwide program, hailed it as a forward step in the direction of even greater public service.

Observers have remarked that the A.M.A.'s new program is not really new, that its basic elements have been part of the program of the A.M.A. and many of its constituent state associations for a number of years. However, this is the first time that all these items have been gathered together, put down in black and white and adopted as a specific platform for all of medicine to follow.

There is a lesson in all this. Medicine has been so steadfast in devoting its energies to the improvement of the science of medicine that the practice side of the picture has been fairly well obscured. Now, due to changing economic conditions and political philosophies, medicine finds itself in the position of having to stress the economic side of medicine in order to protect the scientific side. Public relations, or advertising if you will, must be brought into play in order that the American people may see the medical side of a picture which has too often been painted in glowing colors by the Ladies Bountiful of tax-supported bureaus. As the people will be the final arbiters in the question of compulsory or voluntary health insurance, in order to vote intelligently they must have available the views of the profession of medicine to weigh against the tax-supported blandishments of bureaucrats.

Medical advertising by individual practitioners is still frowned upon for ethical reasons which are well founded. Medical advertising by medicine en masse is something else again and the A.M.A. 12-point program looks like the product to be publicized. The people will be the beneficiaries.

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NOTICES AND REPORTS

Program of the American Medical Association for the Advancement of Medicine and Public Health

A Federal Department of Health.—Creation of a Federal Department of Health of Cabinet status with a Secretary who is a Doctor of Medicine, and the coordination and integration of all Federal health activities under this Department, except for the military activities of the medical services of the armed forces.

Medical Research.—Promotion of medical research through a National Science Foundation with grants to private institutions which have facilities and personnel sufficient to carry on qualified research.

Voluntary Insurance.—Further development and wider coverage by voluntary hospital and medical care plans to meet the costs of illness, with extension as rapidly as possible into rural areas. Aid through the states to the indigent and medically indigent by the utilization of voluntary hospital and medical care plans with local administration and local determination of needs.

Medical Care Authority with Consumer Representation.—Establishment in each state of a medical care authority to receive and administer funds with proper representation of medical and consumer interest.

New Facilities.—Encouragement of prompt development of diagnostic facilities, health centers and hospital services, locally originated, for rural and other areas in which the need can be shown and with local administration and control as provided by the National Hospital Survey and Construction Act or by suitable private agencies.

Public Health. — Establishment of local public health units and services and incorporation in health centers and local public health units of such services as communicable disease control, vital statistics, environmental sanitation, control of venereal diseases, maternal and child hygiene and public health laboratory services. Remuneration of health officials commensurate with their responsibility.

Mental Hygiene.—The development of a program of mental hygiene with aid to mental hygiene clinics in suitable areas.

Health Education.—Health education programs administered through suitable state and local health and medical agencies to inform the people of the available facilities and of their own responsibilities in health care.

Chronic Diseases and the Aged.—Provision of facilities for care and rehabilitation of the aged and those with chronic disease and various other groups not covered by existing proposals.

Veterans' Medical Care.—Integration of veterans' medical care and hospital facilities with other medical care and hospital programs and with the maintenance of high standards of medical care, including care of the veteran in his own community by a physician of his own choice.

Industrial Medicine.—Greater emphasis on the program of industrial medicine, with increased safeguards against industrial hazards and prevention of accidents occurring on the highway, home and on the farm.

Medical Education and Personnel.—Adequate support, with funds free from political control, domination and regulation, of the medical, dental and nursing schools and other institutions necessary for the training of specialized personnel required in the provision and distribution of medical care.

C.P.S. Anniversary

The growth and wide public acceptance of California Physicians' Service is today attracting nationwide attention as the organization observes its tenth anniversary.

Actually, the story of C.P.S. begins in Minneapolis, as far back as 1913, when Dr. Ray Lyman Wilbur, then 38 years of age, stood before the American Academy of Medicine. As president of that organization, he spoke on the subject, "The Physician of the Future." In connection with a discussion of the radical social and mechanical changes which had appeared in American life and the great progress which had been made in medical science and knowledge, the speaker stressed the need of the medical profession to maintain its leadership in social thinking so as to avoid political involvement and control. The speech ended with these words: "The physician of the future has before him the great joy of meeting unsolved problems. He must be brave and learned and full of hope. He must retain the priceless heritage of personality that has come down to him, that spirit of independence that is his by every right, but he must likewise bend to the public need regardless of self. He must join with all of the social forces that can be assisted by his knowledge. The way is stony, but the future is bright; and we can have full faith that the physician of the future will not only see his duty but will meet it with that hope and courage that knows no obstacles and that recognizes no defeat."

The speech created wide discussion and thought, and in 1927 Dr. Wilbur was appointed chairman of the National Committee on Costs of Medical Care. Charged with the responsibility of conducting an extensive five-year survey, this group published its report, with recommendations for action, in 1932.

The report aroused a storm of praise and an equally enthusiastic storm of criticism. Throughout the country action and study ensued. One result was that in 1938 the California Medical Association became the first group to actively sponsor and authorize the formation of a voluntary prepayment plan. To implement the plan, California Physicians' Service was organized, with Dr. Wilbur as its president.

Among the first board members were the following medical leaders: Drs. T. Henshaw Kelly, Samuel Ayres, Jr., Dewey Powell, C. Kelly Canelo, Lowell S. Goin, W. Earl Mitchell, Glenn Myers, Alson Kilgore, Morton Gibbons, and E. Vincent Askey. Any list can only be partial, for the time and energies of hundreds of other doctors in California went into the solid foundation which was a prerequisite to today's growth and wide public acceptance. Lay representation consisted of Rt. Rev. Msgr. Thomas O'Dwyer, of Los Angeles, who still loyally supports C.P.S. as a member of the board.

When C.P.S. opened its doors in February 1939 the road ahead was tenuous and difficult. Nor did the original board of trustees or the initial professional membership of 5,000 California doctors expect an easy time. The idea of a medically sponsored prepayment plan to distribute the costs of medical care was widely disputed. There was no previous experience to serve as precedent. The public itself was wary. Many doctors questioned the procedure and operating philosophy of the organization. And admittedly, many of those problems and questions which arose were not easy to resolve.

In recognition of his vision, energy and leadership in California Physicians' Service, Dr. Ray Lyman Wilbur was recently presented with a scroll of appreciation in his Stanford University office. The scroll was signed by present members of the C.P.S. board of trustees, and was given to Dr. Wilbur by Dr. Chester L. Cooley, C.P.S. board secretary.

But today, more than 710,000 Californians—beneficiary C.P.S. members—gratefully attest that through the difficult early years of trial and error, the medical profession provided a central theme of unity of purpose unmatched in medical economics. The record today shows that the formative years of doubt are over. The problems have been met and constructively translated into a successful and well-proved venture. The pride, satisfaction and appreciation of an ever-increasing beneficiary membership provides a resounding voice in favor of voluntary medical care. It attests the ability and willingness of the medical profession to foresee and take the leadership in meeting a widely recognized social need. Of even greater importance to the medical profession, California is being provided with indisputable evidence that voluntary, free enterprise plans can do a more professional and scientific job than could any compulsory or state-controlled plan.

Statistics can be cumbersome, but a review of the ten-year record of beneficiary and professional membership reveals some gratifying facts: In January 1940, after one year of operation, C.P.S. had 20,000 beneficiary members and 5,000 professional members. (In ten years, beneficiary membership has multiplied by more than 35 times, and 97 per cent of the practicing physicians of California participate.) After five years of operation, C.P.S. opened the year 1944 with 90,000 beneficiary members and 5,200 professional members. (In the last five years — the years of greatest growth — C.P.S. has increased its coverage in beneficiary members by almost eight times.)

Growth such as this in ten short years is unparalleled in history. It dispels any notion, as forwarded by proponents of state plans, that voluntary systems "can't do the job fast enough." And the constant interest and supervision of the board of trustees—members of the profession—prove that the medical profession has not been, and is not today, incapable of adapting high professional standards to the needs of the public.

Today, more than 10,000 employee groups are member of C.P.S. Under the veterans' program, the doctors of California last year gave treatment for service-connected disabilities to an average of 12,000 to 15,000 veterans each month. New beneficiary memberships are being received at a rate of 23,000 new enrollments each month, and over 30,000 claims are paid for members.

The leadership of California's medical profession is recognized throughout the nation. Today there are 65 Blue Shield plans in 43 states and the District of Columbia, with the remaining five states soon to open similar programs. Many of these are adapted after C.P.S., and recognize C.P.S. as a leader and pioneer in the field. Along with Blue Cross and private insurance plans, it is estimated that 52 million Americans, more than one-third of the total population, are now protected under some form of hospital expense insurance, and that voluntary surgical expense plans cover 26 million, with 9 million persons covered by voluntary medical expense plans.

C.P.S. still is governed by an outstanding group of medical leaders. Dr. Goin is president; Dr. A. E. Moore and Dr. H. Randall Madeley are vice-presidents; Dr. Chester L. Cooley is secretary; Dr. Henry L. Gardner, treasurer. Other professional members of the board are Drs. Donald Cass, Kendrick Smith, J. Frank Doughty, Robertson Ward, John H. Rumsey and A. M. Meads. Rt. Rev. Msgr. Thomas O'Dwyer, Mr. Ransom Cook, and Mr. C. Ray Miller also serve as trustees. William M. Bowman is executive director.

C.P.S. Increases Payment to Physicians

Payments to physicians for services rendered to California Physicians' Service beneficiary members on or after January 1, 1949, will be based upon a unit value of $2.15.

This increase will bring an additional income to C.P.S. member physicians of approximately $700,000 yearly, if present utilization rates continue, it was estimated by C.P.S.

The increase in the unit value was made possible by the improvement in the C.P.S. cash position during the past 12-month period, the C.P.S. announcement said, and if no unfavorable change in utilization of service takes place, further increases in the unit value are planned for the future.

The action of the board of trustees in ordering the increase is in line with the stated policy of California Physicians' Service to bring the unit to par value as rapidly as circumstances permit.

Refresher Course on Cancer

The Cancer Commission of the California Medical Association announces a postgraduate (refresher) course on neoplastic diseases for practicing physicians to be given March 22 and 23 in cooperation with Stanford University School of Medicine, University of California Medical School and American Cancer Society, California Division.

Expenses incident to this course are being defrayed by the American Cancer Society, California Division.

Enrollment will be limited to 175. Applications for registration should be mailed to Dr. David A. Wood, Secretary, Cancer Commission, c/o California Division-American Cancer Society, 467 O'Farrell Street, San Francisco 2, California, not later than March 15, 1949.

The program for the two days follows:

TUESDAY, MARCH 22, 1949

Lane Hall, Stanford University Medical School,
Sacramento and Webster Streets

9:00 a.m.—Introductory Remarks—Lyell C. Kinney, M.D., chairman, Cancer Commission.

Malignancies of the Head and Neck—A Symposium
H. Glenn Bell, M.D., moderator.

9:15– 9:35—The Eye and Ocular Appendages—Alfred E. Maumanee, M.D.
9:35– 9:45—Discussion.

9:45–10:05—The Lip—H. J. McCorkle, M.D.
10:05–10:15—Discussion.

10:15–10:35—The Tongue and Buccal Membranes—B. V. A. Low-Beer, M.D.
10:35–10:45—Discussion.

10:45–11:05—The Larynx and Pharynx—Robert C. McNaught, M.D.
11:05–11:15—Discussion.

11:15–11:35—The Ear—Nelson J. Howard, M.D.
11:35–11:45—Discussion.

11:45–12:05—Nodules in the Neck—H. Glenn Bell, M.D.
12:05–12:15—Discussion.

12:30 p.m.—Luncheon.

1:30– 1:50—Diagnosis of Cutaneous Malignancy—Norman Epstein, M.D.
1:50– 2:00—Discussion.

2:00– 2:20—Melanotic Tumors, Benign and Malignant—Nelson J. Howard, M.D.
2:20– 2:30—Discussion.

2:30– 2:40—Recess.

Symposium—Cancer of the Breast
Alson R. Kilgore, M.D., moderator.

2:40– 2:55—Examination to Distinguish Between True and False Lumps—L. R. Chandler, M.D.

2:55– 3:10—Discharge from the Nipple—Leon Goldman, M.D.

3:10– 3:30—Present Opinion About Irradiation as a Supplement to Surgery (in Operable Cancer)—Leonard Dobson, M.D., and Robert S. Stone, M.D.

3:30– 3:55—Hormone and Chemical Therapy—Michael B. Shimkin, M.D.
3:55– 4:45—Discussion.

EVENING SESSION

8:30 p.m.—Psychologic Implications of Cancer—Emile Holman, M.D.
Discussion opened by—Dwight L. Wilbur, M.D., Howard R. Bierman, M.D., Alexander Simon, M.D.

WEDNESDAY, MARCH 23, 1949

Toland Hall, University of California Medical School,
Third Avenue and Parnassus

9:00 a.m.—Panel Discussion—Trauma and Cancer.
Clinical Aspects—Emmet L. Rixford, M.D., moderator.
Pathologic Aspects—David A. Wood, M.D.
Legal Aspects—Edmund Leonard, attorney-at-law.
Discussion.

10:30–10:50—Malignancy in the Male Genital Organs—E. P. Gaynor, M.D.
10:50–11:00—Discussion.

11:00—Cancer of the Colon and Rectum.
Premalignant Tumors—Russell R. Klein, M.D.
Malignant Tumors—Robert A. Scarborough, M.D.
Discussion.

12:30 p.m.—Luncheon.

Symposium on Gynecologic Cancer

Charles E. McLennon, M.D., moderator.

1:30– 1:45—General Problems in the Diagnosis of Bleeding Disturbances in the Female Genitals—Charles E. McLennon, M.D.
1:45– 1:55—Discussion.

1:55– 2:15—The Present Status of Cytologic Diagnosis in Genital Cancers—Herbert F. Traut, M.D.
2:15– 2:25—Discussion.

2:25– 2:45—Changing Concepts in the Therapy of Cancer of the Cervix—Ludwig A. Emge, M.D.
2:45– 2:55—Discussion.

2:55– 3:25—Diagnosis, Treatment and Prognosis in Endometrial Cancer—Earl B. King, M.D.

3:35– 3:45—Recess.

3:45– 4:15—Ovarian Cystadenocarcinomas—Ralph C. Benson, M.D.
4:15– 4:25—Discussion.

4:25– 4:45—The Effects of Pregnancy and Ovarian Function on Cancer—Carl Goetsch, M.D.
4:45– 4:55—Discussion.

Conference on Organization of Hospital Districts

A preliminary meeting of representatives of 29 of the 34 organized local hospital districts of California was held January 7 and 8 at Palm Springs for the purpose of setting up an organization to act as a clearing house for mutual problems, particularly for information regarding formation, planning, fund-raising and legal matters pertaining to district hospital organizations and legislative matters.

At the meeting, which was held at the invitation of the Desert Hospital District, Palm Springs, a temporary committee was appointed to formulate the organization and to consider affiliation with the Association of California Hospitals.

Dr. Jay J. Crane, California Medical Association councilor from Los Angeles, addressed the group on the C.M.A. attitude toward local district hospitals. Emphasizing that organized medicine is interested in providing the highest quality of medical and hospital service possible, he said this could be promoted by instituting and maintaining high standards in the individual hospitals. Questioned as to the attitude toward the use of local district hospitals by licensed osteopathic physicians and surgeons, Dr. Crane said that this was a matter for determination by the board of directors of each local district hospital. However, he called attention to the fact that no hospital could be accredited by the Hospital Committee of the American College of Surgeons or the Council on Medical Education and Hospitals of the American Medical Association if osteopathic physicians and surgeons were members of the staff.

In Memoriam

CARMICHAEL, HUGH. Died in Sacramento, January 13, 1949, aged 48, following a cerebral hemorrhage. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1934. Licensed in California in 1934. Dr. Carmichael was a member of the Sacramento Society for Medical Improvement, the California Medical Association, and a Fellow of the American Medical Association.

✣

COBLENTZ, LAMBERT B. Died in San Francisco, January 28, 1949, aged 68, of coronary thrombosis resulting in heart failure. Graduate of the Cooper Medical College, San Francisco, 1904. Licensed in California in 1904. Dr. Coblentz was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

DONOVAN, MONICA. Died in San Francisco, December 29, 1948, aged 56, of carcinoma. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1917. Licensed in California in 1917. Dr. Donovan was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

EASTMAN, FRANK CREIGHTON. Died in Vicksburg, Mississippi, January 14, 1949, aged 39, of a heart attack. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1940. Licensed in California in 1940. Dr. Eastman was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

✣

JACOBSON, PETER NATHANIEL. Died in Oakland, December 10, 1948, aged 68, of a heart attack. Graduate of Cooper Medical College, San Francisco, 1905. Licensed in California in 1905. Dr. Jacobson was a member of the Alameda County Medical Association, the California Medical Association, and the American Medical Association.

✣

SCHNEDORF, JEROME GERALD. Died, in Big Bear, December 25, 1948, aged 35, of carbon monoxide poisoning and asphyxiation. Graduate of Northwestern University Medical

School, Chicago, 1938. Licensed in California in 1946. Doctor Schnedorf was a member of the Santa Barbara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

TORRENS, AARON SAMUEL. Died in Hanford, January 2, 1949, aged 69, following a stroke. Graduate of the University of Illinois College of Medicine, Chicago, 1909. Licensed in California in 1917. Dr. Torrens was a member of the Kings County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

VAN DALSEM, SAMUEL BURNS. Died in San Jose, January 18, 1949, aged 73, of carcinoma. Graduate of Hahnemann Medical College and Hospital of Philadelphia, 1902. Licensed in California in 1902. Dr. Van Dalsem was a retired member of the Santa Clara County Medical Society, and the California Medical Association.

Lambert B. Coblentz

Lambert B. Coblentz, or, as he was affectionately known by his friends, "Bert" Coblentz, died on January 28, 1949, following an attack of coronary thrombosis suffered on a hunting trip some three weeks previously.

Dr. Coblentz was born in 1880 in Plymouth, Amador County, from where his parents moved, early in his life, to Santa Maria. After attending the University of California and graduation from Cooper Medical College in 1904, he interned at the old German Hospital, now the Franklin Hospital. Returning to Santa Maria to practice, he remained there until 1928, becoming during that time the town's most prominent physician and a civic leader. He moved to San Francisco to practice, and thenceforward his professional activities were largely identified with St. Luke's Hospital. He was a member of the department of medicine of the Stanford School of Medicine until he became emeritus in 1945. He also belonged to numerous medical societies and was active for several years as chairman of the professional conduct committee of the San Francisco County Medical Society, a capacity in which he used unusual skill and tact in the settlement of disputes. As a member of the executive committee of the Editorial Board, a position to which he was appointed in 1943 by Dr. George H. Kress who then was Editor, he served the journal of the California Medical Association willingly and well. At the time of his death he had been a member of the Family Club of San Francisco for over 30 years, and until a few years ago had also been an active member of the Presidio Golf Club.

Bert Coblentz had that rare gift of immediately feeling at home with a new acquaintance. It was therefore only natural that there were unusually many people who considered themselves his friends. He was always ready to lend a helping hand to anyone who needed it. His sense of humor was great, and his inexhaustible fund of stories, many of them dating back to practice in his early Santa Maria days, provided a good laugh on many an occasion. His patients had for him an attachment as well as a feeling of personal closeness and interest far above the usual physician-patient relationship. And so it is not surprising that in his last years it was his practice which, outside his family, consumed most of his interest.

It had been his great wish to go on with his practice and finally to die "with his boots on." While his going is an irreparable loss to his family, his patients and his friends, we can console ourselves a little by the thought that his wish was granted.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

The Rockefeller Foundation has pledged $100,000 for equipment for the new **virus laboratory** of the University of California at Berkeley which is to be under the direction of Dr. Wendell Stanley who joined the faculty last year. The funds will be available for purchases over a three-year period 1949-1951.

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In an attempt to rehabilitate alcoholics, habitual drunkards coming before police court magistrates in Alameda County will, upon conviction, be granted two years' probation and sent to the recently organized Alcoholic Clinic at Santa Rita Prison Farm. There they will be given psychiatric and medical treatment as indicated. Upon release from the clinic, they will be given employment and help by county social workers. The new clinic and the system for handling drunkards was established under an ordinance passed in December by the County Board of Supervisors.

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One thousand pints of whole blood was processed by the **blood bank** of the Alameda County Medical Association in January. A record high for the bank, made possible by its recent move to larger quarters especially designed for the service, the amount still was barely sufficient to meet the growing demand, the medical association reported.

CONTRA COSTA

Dr. George D. Husser of Richmond was installed recently as president of the Contra Costa County Medical Society to succeed Dr. H. B. Neufeld of Concord, who served in 1948. Other officers installed were Dr. C. M. Bolender of Walnut Creek as vice-president and Dr. Bernard B. Gadwood of Richmond as secretary.

LOS ANGELES

Appointment of Dr. John M. Chapman as head of the communicable disease unit of the Los Angeles Health Department has been announced by Dr. George M. Uhl, city health officer. Dr. Chapman, who formerly was director of the tuberculosis division, was named to the new post to fill a vacancy created by the death of Dr. Carl J. Hawley. Dr. Leo Tepper was appointed director of the tuberculosis division.

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Dr. Milo Ellik was installed as president and Dr. Harry Jacob as secretary-treasurer of the **Long Beach branch** of the Los Angeles County Medical Association at a recent meeting of that branch organization. Dr. Ellik succeeds Dr. Frederick Kellogg.

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The Los Angeles County Medical Association **Research Foundation** was officially established in January, with Dr. Louis J. Regan as president, Dr. Benton N. Colver, vice-president, Dr. H. E. Pearson, secretary and Dr. Eugene F. Hoffman, treasurer. Membership in the non-profit organization is made up of persons engaged in laboratory research in medical and allied fields. Besides fostering studies in the cause, prevention and cure of disease, the foundation will gather and administer funds for that purpose and disseminate information on problems and progress in the conquest of disease.

Dr. Elmer Belt was chairman of the meeting establishing the foundation, and Dr. Walter C. Alvarez of the Mayo Clinic spoke on "The Importance of Scientific Research."

* * *

Dr. LeGrand Noyes was elected president and Dr. Franklin Ball vice-president of the Hollywood Academy of Medicine at a meeting in January. Dr. Walter Scott was elected secretary-treasurer.

ORANGE

Dr. Thomas B. Rhone, of Orange, was installed as president of the Orange County Medical Association for 1949 at the annual dinner meeting of the group. Dr. Ardeth Wightman of Laguna became vice-president, and Dr. Llewellyn E. Wilson secretary-treasurer.

SAN FRANCISCO

Dr. William Mushin, professor of anesthesiology at the University of Wales and the Royal College of Surgeons of England, will be visiting professor of anesthesiology at Stanford University School of Medicine for the period March 15 to May 15, Dr. Loren R. Chandler, dean of the school, announced recently.

* * *

Four San Francisco physicians recently were awarded grants for **research on heart disease** by the American Foundation for High Blood Pressure. They are Dr. Norman E. Freeman, Dr. Meyer Friedman, Dr. Ernest W. Page of the University of California Medical School, and Dr. Lelland J. Rather of the Stanford University School of Medicine.

* * *

Four grants totalling $117,461 for **cancer research** at the University of California Medical School were pledged last month by the United States Public Health Service. The largest award, $85,064, was made for support of research work in a ward at the Laguna Honda Home which accommodates 15 patients who volunteer for experimental treatment. A second grant, $25,000, was awarded to support a program for improving the methods of instruction with regard to cancer in medical schools, and a third grant of $4,320 was earmarked to aid studies being carried on by Dr. David M. Greenberg, professor of biochemistry on the Berkeley campus, relative to the process of protein formation. The fourth grant, $3,078, was awarded to support research in special kinds of tumors in mice which are being carried on by Dr. H. D. Moon of the laboratory of experimental oncology.

SANTA CLARA

Dr. Paul V. Morton, who for the past year has served as a director of the **Santa Clara Valley Blood Center,** recently was elected chairman of the board. He succeeded Dr. Donald R. Threlfall in that position. New members of the board of directors are Dr. William L. Molineux and Dr. Herbert T. Browne, who replace Dr. Leon P. Fox and Dr. Morton.

In efforts to stimulate the **recruitment of young women for training as nurses** to solve the shortage in this field, the Woman's Auxiliary to the Santa Clara County Medical Society is planning a bridge party to raise funds to augment a student loan fund, and at the same time is conducting a poster contest offering cash prizes to high school and junior high school pupils for the best posters calling attention to the attractiveness of nursing as a profession. In addition, the Woman's Auxiliary recently entertained students of the county's three nurse training schools at a formal dance at the San Jose Women's Club.

STANISLAUS

Physicians from Merced, Mariposa, San Joaquin and Tuolumne counties were guests of the Stanislaus County Medical Society February 17 at a **postgraduate seminar on heart disease** which was arranged jointly by the Postgraduate Committee of the California Medical Association, the California Heart Association, and the heart committee of the Stanislaus County Tuberculosis and Health Association. Morning, afternoon and evening sessions were held. The program was as follows:

Rheumatic fever. Case presentation and discussion.

The Pathogenesis and Practical Implications of Rheumatic Fever—Dr. Lowell A. Rantz of San Francisco.

Case presentation and discussion by the faculty.

Electrocardiograph Interpretation with Reference to the Precordial Leads—Dr. Maurice Sokolow of San Francisco.

Symposium on degenerative heart diseases. Differential Diagnosis of Chest Pain and Acute Coronary Disease—Dr. Charles A. Noble, Jr., of San Francisco.

The Management of Congestive Failure—Dr. Sokolow.

TEHAMA

Dr. James T. McDuffie of Corning has been elected president of the Tehama County Medical Association for 1949 to succeed Dr. R. G. Frey of Red Bluff, retiring president. Dr. Arthur H. Meuser of Corning became vice-president and Dr. Donald E. Thompson of Red Bluff, secretary-treasurer.

GENERAL

The California Society of Anesthesiologists will hold its first annual meeting in San Francisco, March 14-16. Further details may be obtained from the secretary of the Society, Dr. Bruce M. Anderson, Samuel Merritt Hospital, Oakland.

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The tenth annual spring postgraduate **Convention in Ophthalmology and Otolaryngology** will be held in Portland, June 19-24, under the auspices of the Oregon Academy of Ophthalmology and Otolaryngology. Guest speakers will be Dr. Lawrence R. Boies, professor of ophthalmology at the University of Minnesota Medical School; Dr. Leland Hunnicutt, associate clinical professor of otolaryngology at University of Southern California; Dr. James H. Allen, professor of ophthalmology at Iowa State University School of Medicine, and Dr. Edmund B. Spaeth, professor of ophthalmology, Graduate School of Medicine, University of Pennsylvania.

Medical Films - Annual Session

Facilities will be available for showing 16 mm. sound or silent films at the 1949 Annual Session of the California Medical Association to be held in Los Angeles May 8 to 11. To select films suitable for showing and to make up a program for their showing, a special committee has been named by the Committee on Scientific Work.

Any member who has one or more films available for this showing should contact Dr. Conrad J. Baumgartner, 409 N. Camden Drive, Beverly Hills. Films should be shipped to Dr. Baumgartner for viewing by the committee. They should be sent as soon as possible and in no case later than April 1, 1949.

BOOK REVIEWS

CLINICAL UROLOGY, ESSENTIALS OF DIAGNOSIS AND TREATMENT. Second Edition. By Lowrain E. McCrea, M.D., Clinical Professor of Urology, Temple University Medical School. 265 illustrations, 7 color plates. F. A. Davis Company, Publishers, Philadelphia, 1948. $6.50.

This is a treatise for the general practitioner and part-time urologist. It is a ready reference work as an aid in the diagnosis and treatment of urologic conditions usually seen in the office. Many techniques and therapeutic procedures are concisely outlined and drugs which the author has found of value are described in detail. Data on the most recent use of the sulfonamides and antibiotics have been brought up to date. not in a single or separate chapter, but in association with the variously described pathologic conditions. A number of rare and unusual conditions, some almost medical curiosities, are described at length with numerous photographs. There are many good illustrations, some depicting pathologic conditions, other schematically showing the technique of various urologic procedures. The type used is large and clear. the paper good and the book easy to read.

* * *

BAILEY'S TEXTBOOK OF HISTOLOGY. Revised by Philip E. Smith, Ph.D., Professor of Anatomy, College of Physicians and Surgeons, Columbia University, and Wilfred M. Copenhaver, Ph.D., Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University, The Williams and Wilkins Company, Baltimore, Maryland, 1948. $7.00. 800 pages, 455 illustrations. Twelfth Edition.

Of the standard textbooks of medical histology this one, now in its twelfth edition, presents the subject in a highly lucid manner and is certainly one of the outstanding books in the field. The illustrations which accompany the text are numerous, well chosen, and clearly reproduced. The revisions in this edition correct a number of faulty portions of the previous volume and include the results of many recent developments.

The book is organized into 22 chapters of which the first three are devoted to considerations of the cell and to development. Of unique interest in this connection is Chapter II, which discusses the structure and function of living cells and the methods by which such observations of living cells are established. Within the 20 pages of this chapter a concise and stimulating introduction to the vast and ever-widening field of cellular physiology is presented to the student. The next seven chapters are devoted to a consideration of the tissues of the body, while the remaining 12 describe the organ systems.

Considerable repetition of ideas is to be noted in the three chapters devoted to nervous tissue and the nervous system which take up one-eighth of the entire text. Some of the material presented is more appropriate to a text of neuroanatomy. It is suggested by the reviewer that the space devoted to this subject be condensed into a single, more concise chapter.

The authors' intent is that this text be primarily for the use of first-year medical and dental students and for this purpose it is admirably suited in clarity and conciseness of description, judicious handling of controversial points and nicety of illustration. The inclusion of a few key references for each chapter may stimulate the reader to further exploration within the limits of his time.

The reviewer is of the opinion that the text, while in no sense a complete reference work, deserves a place in the library of the practicing physician, the research worker, and the biological scientist because of its able and broad coverage of the subject of histology.

TREATMENT OF HEART DISEASE. By William A. Brams, M.S., M.D., Ph.D., Associate Professor of Medicine, Northwestern University Medical School, and Attending Physician, Michael Reese Hospital, Chicago. New, First Edition. 195 pages, with 11 figures. Philadelphia & London: W. B. Saunders Company, 1948. Price $3.50.

This book is a compact discussion of cardiac therapy and is a sound, conservative, practical discussion of the subject. The author is well qualified to guide the practitioner in this important sphere of medicine and has produced a very comprehensive book despite its relatively small size. In addition to the usual systematic discussion, Dr. Brams has included excellent chapters on the pharmacology of drugs such as digitalis, quinidine, the mercurials, etc., that are used in the treatment of heart disease.

A few minor criticisms may be of value. In the treatment of cardiac failure, the author advocates absolute bed rest and in the interest of the patient's comfort, advises a rolled pillow under the knees (p. 54). The dangers of venous thrombosis by this procedure were not noted by the author and most cardiologists would hesitate to advise anything that increases the risk of embolic complications in a severely ill chronic cardiac patient. The therapeutic value of aminophylline in acute pulmonary edema has been minimized by the author (p. 71), especially in view of the work of McMichael and his associates who demonstrated a marked fall in right atrial pressure and a rise in cardiac output in patients with left ventricular failure. The author advises a single oral dose of 1.2 mg. of digitoxin when cardiac failure occurs after myocardial infarction (p. 85). The dangers of inducing ventricular arrhythmias and of inducing vomiting with a single large dose of digitoxin are such that divided doses are preferable. On page 100 Brams states that slowing of the ventricles to a normal range is a satisfactory therapeutic result in the treatment of auricular flutter. The danger of a sudden decrease in A. V. block with abrupt doubling of the ventricular rate and possibility of acute symptoms is a good reason for advising further attempts to produce a normal rhythm by increasing the amount of digitalis or utilizing quinidine in all cases in which no contraindication exists.

In the next edition it would be advisable to expand the important chapter on congenital heart disease and pericarditis. These are given inadequate treatment. Further data on the use of massive doses of penicillin in subacute bacterial endocarditis with resistant organisms would also be important. On page 118, the author implies that 6,000,000 units daily is the maximum dose used. The use of fourfold this amount is not uncommon. The possibilities of the therapeutic use of streptomycin were not discussed.

Despite the above criticisms, the book can be recommended as a valuable and practical discussion of the current methods of treatment of heart disease.

* * *

PHYSICIAN'S HANDBOOK, FIFTH EDITION. By John Warkentin, Ph.D., M.D., and Jack D. Lange, M.S., M.D., University Medical Publishers, P. O. Box 761, Palo Alto, California. Price $2.00.

The value of this compact handbook is attested by the appearance of a new edition within two years. As the authors have stated in their preface, the purpose of the book was to summarize concisely. clearly and comprehensively, diagnostic procedures, factual data and other reference data serviceable for many types of medical practice. In the reviewer's opinion, the authors have succeeded admirably and this book can be recommended as one of the most complete pocket reference manuals available. The necessity for brevity has prevented elaboration on certain therapeutic suggestions but this is a minor criticism. The inclusion of considerable new data in this revision indicates the constant attempts of the authors to keep the handbook alive and up-to-date.

* * *

MICROBIOLOGY AND PATHOLOGY. By Charles F. Carter, B.S., M.D., Instructor in Pathology and Applied Microbiology, Parkland Hospital School of Nursing, Dallas. Texas. With 216 Text Illustrations and 25 Color Plates. Fourth Edition. The C. V. Mosby Company, St. Louis, Mo., 1948. $5.00.

This book is designed for the teaching of nurses. It covers a very large field, and so cannot be expected to go into great detail. This has apparently been recognized, and simple conventional presentations have been used. Controversial discussions are rarely included, and relatively little is said of the pathogenesis of the diseases discussed. The illustrations in the section devoted to pathology emphasize the gross features of disease. At the end of each chapter is a series of questions for review and a group of "true-false" and "completion" statements is included. A final short chapter outlines some simple laboratory exercises.

The book is probably satisfactory for the teaching of nurses, and it would convey a general idea of medicine to a layman. but this idea would be inadequate with respect to the problems of medicine and to the complexity of the subject.

* * *

A TEXTBOOK OF PATHOLOGY. By E. T. Bell, M.D., Professor of Pathology, University of Minnesota, 910 pages, 500 engravings and 4 color plates. Sixth Edition. Lea and Febiger, Philadelphia, Pa., 1947. $10.00.

The sixth edition of Bell's Textbook of Pathology conforms to the high standards of previous editions. The greater part of the book is written by Dr. E. T. Bell, the chapter on heart disease by Dr. B. J. Clawson, and the chapter on liver disease by Dr. J. S. McCartney. Both of the latter have spent many years in study on the subjects discussed by them.

The book is written largely from the authors' own experiences and opinions and the text is agreeably free from discussion of theories and disputed subjects. Parts of the text of the previous edition have been revised and new material, especially in the fields of vitamin deficiencies and tropical diseases, has been added in order to bring the text in accord with current medical opinion and interest. The authors' many years of experience, however, have kept them from going too far with new ideas as yet not conclusively proved.

The book is divided about equally into the discussion of general fundamental pathological processes and description of diseased conditions of organs of the body. Discussion of most of the subjects is flavored with conservative clinical correlation. Particularly is this true in the chapter on renal disease, a subject on which Dr. Bell has been an outstanding authority for years. However, there is no discussion of the subject of lower nephron nephrosis under this title, but if the reader is qualified to do his own hunting he will find interspersed in the text information about most of the various conditions producing this lesion. The description of virus pneumonia, in this reviewer's opinion, is insufficient for the importance of this disease.

The illustrations, 500 in all, are well chosen and they are for the most part well made, clear photographs. The quality of the photomicrographs is not surpassed by any textbook of pathology in use in this country today. A fairly adequate list of references is given at the end of each chapter. Some of these lists include a few too many of a decade ago and not enough of those of the last few years, which are more available to readers without access to large medical libraries.

On the whole this book, written in a conservative style in easily read English, should serve well as a textbook for students and as a storehouse of information for the practicing physician.

* * *

PARATHYROID GLANDS AND METABOLIC BONE DISEASE. By Fuller Albright, M.D., Associate Professor, Medicine, Harvard Medical School; and Edward C. Reifenstein, Jr., M.D., Consultant-in-Charge, Department of Clinical Investigation, Sloan-Kettering Institute of Cancer Research, Memorial Hospital Cancer Center, N. Y. The Williams and Wilkins Company, Baltimore, Md., 1948. $8.00.

The monograph on some special disease or group of disorders has come to occupy an important place in modern medical literature. The background of clinical medicine has become almost unbelievably complex, and precise discussion by the skilled specialist is essential if the general physician is to be educated and trained for the best sort of practice.

The writers have done their audience a great service in bringing together their pioneer work and summarizing that of others on the important subject of metabolic bone disease. The discussion proceeds in orderly fashion—the principles of normal growth of bone, pathological physiology and finally the actual applications to disease. Although Dr. Albright writes in a delightfully lucid style one soon realizes the immense complexity of the subject, and especially the abstruse interaction of many chemical factors which in parts of the discussion leaves the reader quite confused. The text is profusely illustrated with charts, tables, photographs, and other visual aids to understanding such an involved subject. We have seen few books recently which have given us more pleasure and satisfaction; Dr. Albright and Dr. Reifenstein have set up standards of scholarship of which American medicine may well be proud.

* * *

CRIME AND THE MIND—AN OUTLINE OF PSYCHIATRIC CRIMINOLOGY. By Walter Bromberg, M.D., formerly Director, Psychiatric Clinic, Court of General Sessions, New York, N. Y. and Senior Psychiatrist, Bellevue Psychiatric Hospital, New York, N. Y. J. B. Lippincott Company, Philadelphia, 1948. $4.50.

This is an interesting account, from the psychoanalytic viewpoint, of the psychopathology of various types of criminal. The author has had a good deal of experience in dealing with this problem, both in the Navy and civilian courts, and although one cannot always subscribe to his interpretation of the case histories he presents, the material in itself is of considerable value. He makes a valiant attempt in the first few pages to avoid the use of analytical terms, but the effort proves too much for him and he soon lapses into the usual clichés.

There are two pitfalls for the physician untrained in psychiatry in reading this book; he may either credulously accept all of the author's interpretations as reliable, or he may, in being unable to swallow some of the more extravagant of them, disgorge the whole. If these dangers can be avoided, there is much to be learned from this volume.

* * *

MALIGNANT DISEASE AND ITS TREATMENT BY RADIUM. By Sir Stanford Cade, K.B.E., C.B., F.R.C.S. Surgeon, Westminster Hospital, Mount Vernon Hospital and Radium Institute. With a Foreword by Sir Ernest Rock Carling, F.R.C.P. Volume I, Second Edition. The Williams and Wilkins Co., Baltimore, Maryland, 1948. $12.50.

Although the first edition of this book, published in 1940, was almost immediately destroyed by bombing, the author is now republishing it.

Dosage in radium therapy has for many years been, for the most part, empirical in nature. Perhaps as a result it has become traditional in radium texts to refer to dosage only in the widest generalities. Unfortunately this book does not deviate from this tradition, and even though information is available on modern methods of radiation dosimetry, as the references indicate, the subject is unfortunately covered only sketchily.

It would also be nice to know what the safe dosage is near structures such as the eye, instead of being informed, "Prolonged gamma radiation . . . is likely to lead to permanent damage and should be avoided . . ." Naturally what the radium therapist wants most to know is what is meant by "prolonged radiation."

Chapters on the effects of radium on malignant tumors and on tissue culture and experimental radiology are well done.

* * *

CONTEMPORARY RELIGIOUS JURISPRUDENCE. By T. H. Rubenstein of the Illinois Bar. The Waldain Press, Chicago, 1948. $2.50.

In the 120 pages of "Contemporary Religious Jurisprudence," I. H. Rubenstein of the Illinois bar attempts to clarify and state the criminal and civil aspects of the major polemical tenets of fortune-telling, faith healing and pacifism.

With candid frankness and honesty the author aptly points out the conflict of these tenets with the public welfare, health, morals and safety of society. With each of the three tenets of fortune-telling, faith healing and pacifism the author gives a brief definition and history, and then explores the criminal and civil aspects with relation to society as a whole.

With the two tenets of fortune-telling and faith healing, the irreconcilable conflict with medical practice acts is pointedly brought out. This is done by the narration of actual cases and experiences which are of record. The fact is made clear that if the advocates of these tenets were allowed to exploit civilization, they would repeal all medical and public health safeguards and expose the nation to the menace of uncontrolled, unguided and unintelligible practice of the healing arts.

In his treatise on all of the three tenets the author points out that "Law, with its consequence in justice, must act as a bulwark of Society against the onslaughts of those who would use religion as a word to gain their fanatical desires and ends."

* * *

STANDARD RADIOGRAPHIC POSITIONS. By Nancy Davies, M.S.R., C.T. Senior Radiographer, Malvern General Hospital, Malvern, and Ursel Isenburg, M.S.R. Radiographer, Royal Free Hospital, London. Second Edition. The Williams and Wilkins Co., Baltimore, 1948. $6.00.

This text is elementary in nature, and uses only line drawings instead of actual radiographs. Nevertheless, it covers the subject quite well, and should prove to be useful for those who are beginning the study of x-ray technique.

* * *

CONTROL OF PAIN IN CHILDBIRTH—Anesthesia—Analgesia—Amnesia. By Clifford B. Lull, M.D., Director, Division of Obstetrics and Gynecology, Philadelphia Lying-in Unit, Pennsylvania Hospital; and Robert A. Hingson, M.D., Associate Professor of Obstetrics; Anesthesiologist, Department of Obstetrics, Johns Hopkins University Hospital; Surgeon, U.S.P.H.S. Introduction by Norris W. Vaux, M.D., Consulting Obstetrician and Gynecologist, Philadelphia Lying-in Unit of Pennsylvania Hospital. Third Edition. Revised and Enlarged. J. B. Lippincott Company, Philadelphia, 1948. $12.00.

This important and extensive survey of obstetric analgesia and anesthesia, now appearing in its third edition within four years, has been reviewed elsewhere on numerous occasions. The first quarter of the volume includes a basic discussion of sacral anatomy and of the innervation of uterus and bladder, contributed by two anatomists from Washington University, as well as a pharmacologic description of all the agents commonly administered during labor and delivery. At the end of Part One there is a brief essay on the psychology of fear during labor, but since this chapter amounts essentially to an advertisement for caudal anesthesia it could well be omitted. Part Two, the largest section, is concerned largely with details of the various techniques for relieving obstetric pain. In this section the book suffers from the fact that the authors have appropriated and reproduced verbatim several articles which have appeared in periodicals, such as the lengthy article on saddle-block anesthesia by Andros and others which was published in the American Journal of Obstetrics and Gynecology, May 1948, while in other instances subsections have been contributed by quite an array of persons, some of whose names are mentioned briefly in the preface. The result is confusion, repetition, and lack of editorial coherence, not to mention a surfeit of graphs, charts, tables and drawings, many of which have been taken from the brochures of pharmaceutical manufacturers. It appears that this section of the book badly needs rewriting in the language of the authors. Part Three (which is not denoted as such in the table of contents) undertakes to discuss the choice of anesthesia for an extensive array of obstetrical complications and includes a chapter on care of the newborn infant, written by two pediatricians. Some of the material in this chapter seems out of place in a volume on anesthesia. The last 25 pages of the book are given over to reprinting in its entirety an article on newborn mortality which appeared in the Journal of the American Medical Association for January 24, 1948. Here again one questions the desirability of including material in this form within the covers of a book. Despite these obvious shortcomings the volume is a real storehouse of information and will continue to be a standard reference in its field.

* * *

SYNOPSIS OF PSYCHOSOMATIC DIAGNOSIS AND TREATMENT. By Flanders Dunbar, M.D. and others and the members of the staff of the departments of Medicine and Psychiatry Columbia-Presbyterian Medical Center, New York City. The C. V. Mosby Company, St. Louis, Mo., 1948. $6.50.

The author has compiled a very useful handbook on psychosomatic diagnosis and treatment for the general practitioner. It is exceedingly logical and simple, and a valuable volume for the library of every physician. The introductory chapter defines "Functional Diseases" and brings them within the purview of psychosomatic medicine. Emphasis is placed upon the unknown menace of the psychoneuroses, and indications are given that etiologically these disorders may arise from the tempo of our civilization. It is significant that there is a marked psychosomatic component in hypertension, hyperventilation and hyperthyroidism, and many other diseases, and that the change in the incidence of peptic ulcer and coronary artery disease in the male is in part a resultant of the cultural pressure of society on the individual. The diseases to which an individual may become heir are the results of the interplay of the physical and psychic constitutions. There is an excellent chapter on embryology in its relation to psychosomatic disorders, wherein illness is considered essentially a response, conditioned or unconditioned, to a stimulus acting upon the individual at any moment of his existence. In the chapter on predisposition to psychosomatic dysfunction, the author discusses the mechanism of organ selection as an expression of the preponderant emphasis of the emotions on the soma. Many of these predispositions may be acquired in utero or in early life. There is a fine chapter on the physiology of the autonomic nervous system in which is discussed the effect of psychic impulses on the mechanisms of disorder of the nervous system.

The chapter on the psyche in relation to the gastrointestinal tract and especially on the disease entity, colitis, is very fine. The approach in this field is purely objective, and the information discussed is essential to the internist and general practitioner.

The chapter on the vasomotor system, especially in relation to disorders of the skin, sheds new light upon the intricacies of this subject. The author emphasizes that disorders of the skin are greater than skin deep. The chapter on the eye, ear, nose, throat and dentition is excellent and well authenticated with photographs and references.

There is a section devoted to metabolic and endocrine disturbances with special emphasis given to the subject of diabetes. In this disease it is absolutely necessary to appraise the psyche in order to understand the behavior of the diabetic patient. The same applies to the understanding of hyperthyroidism and obesity. A chapter on arthritis and joint diseases, including an excellent essay on gout, throws new light upon the psychic components in these disorders. The remainder of the book is devoted to the circulatory system, the respiratory system (a fine discussion of the psychosomatic aspects of asthma), the genito-urinary disorders, with a terse and intelligent presentation of the problem of impotence and frigidity, and then two fine chapters on "accident-proneness" and the neuroses, the latter being especially pointed, and understandable.

The volume is highly recommended for the physician's library.

* * *

AN INTRODUCTION TO GASTROENTEROLOGY. By Walter C. Alvarez, M.D., Professor of Medicine, University of Minnesota, The Mayo Foundation. Fourth Edition, Revised and Enlarged. 269 Illustrations. Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, New York, 1948. $12.50.

The fourth edition of Alvarez's book is an expansion of the third. The heaviest additions are in the chapters on the pylorus, the nerves to the bowel, the nerves of the gallbladder, the functions of the colon, flatulence, the electroenterogram, technical methods and apparatus and the effect of vagotomy in man. It serves admirably as a summary of the author's ideas and work during the past 30 years, especially on the gradient theory, to which the entire first portion of the book is devoted.

It is an excellent reference for anyone doing research in gastroenterology and for the gastroenterologist in practice. It is well and interestingly written. However, one sometimes has difficulty in separating Dr. Alvarez's own ideas or theories from the record of more proved facts.

The bibliography is extensive, running to 2,800 titles and 136 pages. Unfortunately, these articles are not numbered, which makes it difficult to trace the source work—especially when one author has multiple articles to which one reference is made. There is a summary at the end of each chapter giving the essentials of the chapter for those not wishing to go through the whole of it. These summaries in themselves are quite full, at times running to more than five pages.

The Paul B. Hoeber Company has done a handsome job of printing and binding.

* * *

BIOLOGY OF PATHOGENIC FUNGI. Edited by Walter J. Nickerson. This is Volume VI of the "Annales Cryptogamici et Phytopathologici," published at Waltham, Mass., the Chronica Botanica Co., San Francisco, J. W. Stacey, Inc. Price, $5.00.

This book is the first of its kind, in the English language, which brings together present knowledge of the biology of pathogenic fungi. As J. Gardner Hopkins points out in the foreword, much effort has been expended on arguing nomenclature in mycology to the neglect of studies on the biology of the fungi themselves, a subject of much greater importance for the diagnosis and cure of fungus diseases.

The present volume is of great value to mycologists, laboratory workers, and dermatologists. There are outstanding chapters on nutrition and metabolism of pathogenic fungi, the metabolic products of fungi, the lipids, respiration and fermentation. The chapter on chromoblastomycosis appears somewhat lengthy and out of proportion for North American readers.

The biologic approach to the fungus diseases is as fundamental and will be just as productive of results as has been the biologic approach to other disease problems. The editor, the contributors, and the publishers are to be congratulated on having made a very important step in this field.

* * *

THE CASE AGAINST SOCIALIZED MEDICINE — A Constructive Analysis of the Attempt to Collectivize American Medicine. By Lawrence Sullivan. The Statesman Press, National Press Building, Washington 4, D. C., 1948. $1.50.

This is a brief but cogent statement of many of the drawbacks inevitable in socialized medicine, written by a Washington journalist who has also published some interesting volumes on bureaucracy in our national capital. The arguments are familiar to most medical men but perhaps to few of the public. For this reason, physicians might be well advised to send copies of this book to their friends who are in a position to influence legislation, especially members of the labor movement, thoughtful social workers, congressmen and senators.

In so doing they might care to stress the enormous swelling of the numbers of people attending doctors' offices and out-patient departments in hospitals under any socialized scheme. Trivial ailments, that are normally passed over, occupy 90 per cent of the doctor's time. Laboratory tests and x-rays triple in number, over three-fourths of them being a waste of time and material. Besides filling out innumerable forms, the doctor has to account for every little item for which he needs replacement. For example, even the smallest suture needle, when rusted or broken, must not be discarded. It must be returned to headquarters before a new one can be issued.

One large hospital clinic in England recently ran out of 6-inch plaster strips for treating ordinary traumatic lesions of the leg and trunk. Some official in London had cancelled the hospital order for plaster of paris bandages for some reason or other. Now the over-worked nursing and medical staff must find time to make home-made bandages for these cases. These are facts which your reviewer can validate by date and institution.

Physicians should remember that actual practice of their profession is but one part of their contribution to public welfare. Another and significant part is the maintenance of conditions under which good medical services can be furnished. This little book may aid in such maintenance.

* * *

CLINICAL NEURO-OPHTHALMOLOGY. By Frank B. Walsh, M.D., Associate Professor of Ophthalmology, Johns Hopkins Medical School. Williams and Wilkins, Baltimore, Md., 1947. $18.00.

Clinical Neuro-Ophthalmology is a very comprehensive textbook. The subject matter occupies 1,422 pages and 17 chapters.

The book is too exhaustive to attempt to outline, but it can be pointed out that it is in itself a reference library on this subject.

Chapter IV upon pupillary responses and Chapter VII upon congenital abnormalities and diseases of the eye and the central nervous system are small texts in themselves.

This book is a text and reference book that should be in every ophthalmological library.

MEDICAL JURISPRUDENCE

CONSENT TO THE PERFORMANCE OF OPERATIONS—INCOMPETENT ADULTS—RESTORATION TO COMPETENCY

Peart, Baraty & Hassard *of the California Bar*

It is a rule of very general application that a physician or surgeon cannot operate upon a patient without first obtaining the consent of that patient. In order to give this consent, the patient, of course, must be legally competent. Two classes of persons are recognized by the law as being incapable of giving such consent, that is: (1) minors; and (2) mentally incompetent adults.

This discussion will concern itself only with the second class and the procedure whereby a person who has been adjudicated an incompetent and has been committed to a state institution may be restored to legal capacity and thereafter, may be able to consent to an operation. Under Section 6729 of the Welfare and Institution Code, a superintendent of a state hospital may discharge any patient who "in his judgment" has recovered. The superintendent must merely file his written certificate with the Director of Institutions. Thereafter, the person who has been committed may be released and may ostensibly appear to be legally competent. However, the discharge by the superintendent of a state hospital in and of itself does not have the legal force and effect of restoring the patient to competency. Thus, any patient who has once been committed and thereafter released cannot legally consent to an operation, for he has not as yet been legally restored to competency. If a doctor in treating a patient becomes aware of the fact that a patient has once been an inmate of a state institution, he should immediately proceed with caution and determine whether the patient has been legally restored to competency.

A patient in this state can be restored to competency if the superintendent of the state hospital, after discharging the patient who, in his judgment, has recovered, files his written certificate to that effect with the Director of Institutions and under Section 6729 of the Welfare and Institution Code, sends a copy of the certificate of discharge duly certified to the clerk of the superior court of the county from which the person was committed. The certified copy and the record of the same must then be recorded by the clerk of that Superior Court in a book kept for that purpose, and thereafter this record shall have the same legal force and effect as a judgment of restoration to capacity. This method of restoration to capacity is in addition to a formal adjudication of competency by a court in a guardianship proceeding. If the requirements have not been complied with, then legally the patient is still incompetent and therefore unable to legally consent to any operation.

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The Use of Radioactive Iodine in the Treatment of Graves' Disease

MYRON PRINZMETAL, M.D., CLARENCE M. AGRESS, M.D., H. C. BERGMAN, Ph.D., and BENJAMIN SIMKIN, M.D., *Los Angeles*

SUMMARY

Fifty patients with uncomplicated Graves' disease were treated with radioactive iodine (I_{131}). Twenty-six patients who were followed for one year or longer are the basis of this report. Twenty-five are now euthyroid; only one is not completely well.

The total dose of radioiodine administered varied from 0.5 to 10 millicuries. The average length of time necessary for return to a euthyroid state was from three to four months.

Hypometabolism developed in three patients, and in one the signs and symptoms of myxedema developed. No other complications ensued. One patient who apparently relapsed had complete return to normal after further iodine administration.

The determination of the uptake of radioactive iodine by the thyroid gland is a useful diagnostic procedure in differentiating conditions simulating hyperthyroidism.

Following treatment with radioactive iodine, the thyroid gland becomes smaller, the uptake of iodine by the gland is reduced, and the level of organic iodine in the plasma becomes normal.

In acute thyroiditis, in spite of a high basal metabolic rate, high content of organic iodine in the plasma and other evidences of "hyperthyroidism," the uptake of I_{131} has been very low.

THE USE of radioactive iodine as a therapeutic agent in the treatment of Graves' disease was first reported in 1942 by Hertz and Roberts[4] and by Hamilton and Lawrence.[2]

The rationale for the use of the iodine isotope was as follows: The avidity of the thyroid, especially the hyperplastic gland, for iodine has been known for a long time. For over 40 years it had also been known that external x-ray irradiation over the region of the thyroid gland could produce a clinical remission in some patients with Graves' disease. Radioiodine combines these two properties in that (1) it is selectively taken up by thyroid tissue in the same manner as the naturally occurring element, and (2) it emits beta and gamma rays *in situ*, thus producing maximal internal irradiation at the desired location. The administration of radioactive iodine was found to have the added advantage of being taken up in relatively small amounts by normal glands and in greatly increased amounts by hyperplastic glands, thus giving proportionately greater radiation to the hyperplastic glands of patients with hyperthyroidism. Further, it was soon found that the determination of the uptake of the administered radioiodine by the gland was of diagnostic importance, especially in those cases in which the diagnosis of hyperthyroidism was difficult to determine clinically.

From Cedars of Lebanon Hospital, Los Angeles.

The studies herein reported were endowed by grants from the Blanche May and Beaumont Trust Funds.

Presented as part of a Symposium on Thyroid Diseases before a joint meeting of the Sections on General Surgery, General Medicine, Pathology and Bacteriology, and Radiology, at the 77th Annual Meeting of the California Medical Association, San Francisco, April 11-14, 1948.

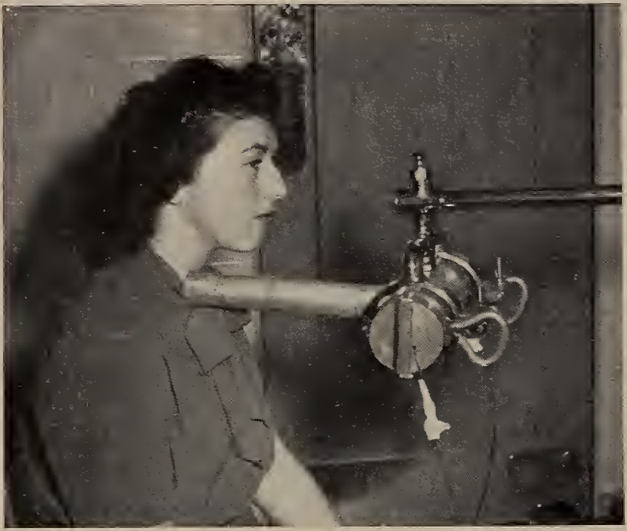

Figure 1.—Demonstration of technique for making Geiger counts over the thyroid gland. The paper cylinder aligns the gland with the counter and maintains the standard distance of 29 cm.

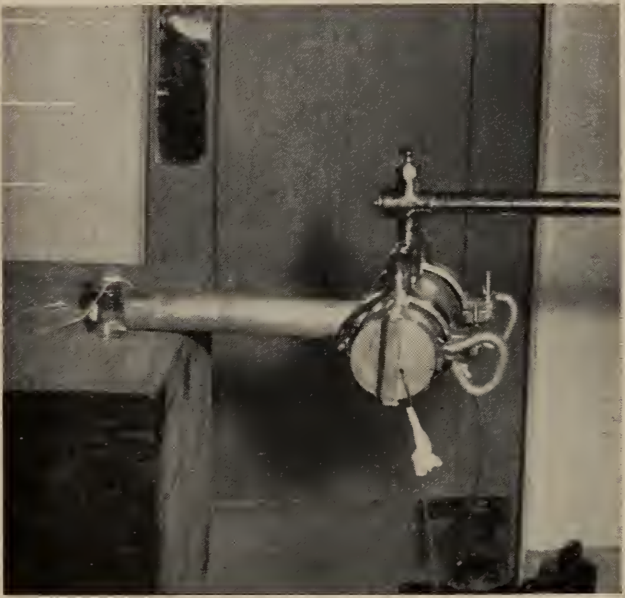

Figure 2.—Method of making comparative count of the standard. Note that paper cylinder still maintains the standard distance and that the diameter and contour of the bottle roughly correspond with a patient's thyroid gland.

TECHNIQUE

Since receiving our first shipment of radioiodine (I_{131}) from the uranium pile at Oak Ridge, Tennessee, in January 1946, we have treated over a hundred patients with thyrotoxicosis, of whom 44 have been followed for more than one year. In brief, the technique is as follows: The patient, previously maintained on a low iodine dietary intake for a period of four to six weeks, is given a small tracer dose of I_{131}, usually 0.5 to 1.0 millicurie. The material looks and tastes like water and is taken orally. Simultaneously, the same dose of radioiodine is placed in a 50 cc. vial and diluted to a total volume of 50 cc. with distilled water. This material serves as a standard for subsequent measurements of radioactivity. The patient returns for measurement within a 48-hour period. He sits comfortably in front of a shielded Geiger counter, the opening of which is 29 cm. from the thyroid gland (Figure 1), and the radiation emanating from the region of the thyroid gland is measured; this is the neck count. A count over the thigh is made, in order to account for the radioiodine contained in the non-thyroid tissues, and this is subtracted from the neck count, thus giving the amount of I_{131} taken up by the thyroid. The count of the standard is also determined at this time and is taken as 100 per cent (Figure 2); the factor of decay is thus eliminated. The thyroid count divided by the count of the standard gives the percentage uptake of iodine by the thyroid gland.*

In euthyroid individuals, the iodine uptake by the thyroid gland varies from 10 to 30 per cent. The patients with untreated Graves' disease have shown uptakes ranging from 35 to 98 per cent. Experience has justified considerable reliance on this test as a diagnostic aid.

RESULTS

We have divided the patients with thyrotoxicosis into two groups: (1) patients with uncomplicated Graves' disease and (2) hyperthyroid patients with various complications which will be reported elsewhere.[5] Of the 26 patients without complications who were followed for one year or longer, all but one are now clinically well and the latter is greatly improved. One patient relapsed but again responded after readministration of radioiodine. Two patients returned to a euthyroid state but were left with nodular glands for which surgical removal was advised. Both so far have refused operation.

All patients had elevated plasma organic iodine levels before treatment, the average value being 11.3 micrograms per 100 cc. The average value after treatment was 6.3 micrograms per 100 cc. of plasma. Clinically, these patients have shown the usual criteria for remission: weight gain, return of pulse rate to normal, disappearance of tremor and decrease in size of the thyroid gland, usually with complete disappearance of the enlargement. The estimated size of the thyroid before treatment varied from 25 to 75 gm., averaging 38.7 gm., and after treatment averaged about 20 gm. It was found that a period of three to four months was required for a return to a euthyroid state in these patients. The total dose of I_{131} given ranged from 0.5 to 10 millicuries, averaging 4.4 millicuries. The uptake of I_{131} before treatment ranged from 31.7 to 100 per cent, with an average of 62.4 per cent, and after treatment ranged from 1.5 to 76.0 per cent, averaging 27.3 per cent. A typical case is presented in Figure 3 and described below:

CASE REPORT

A 31-year-old white female complained of nervousness, fatigue, sweating, diarrhea, pain in legs, and loss of weight. Examination revealed a large thyroid gland with an esti-

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*This method of administering I_{131} was originally described by Soley and Miller,[6] who were of valuable assistance in the conduction of this study.

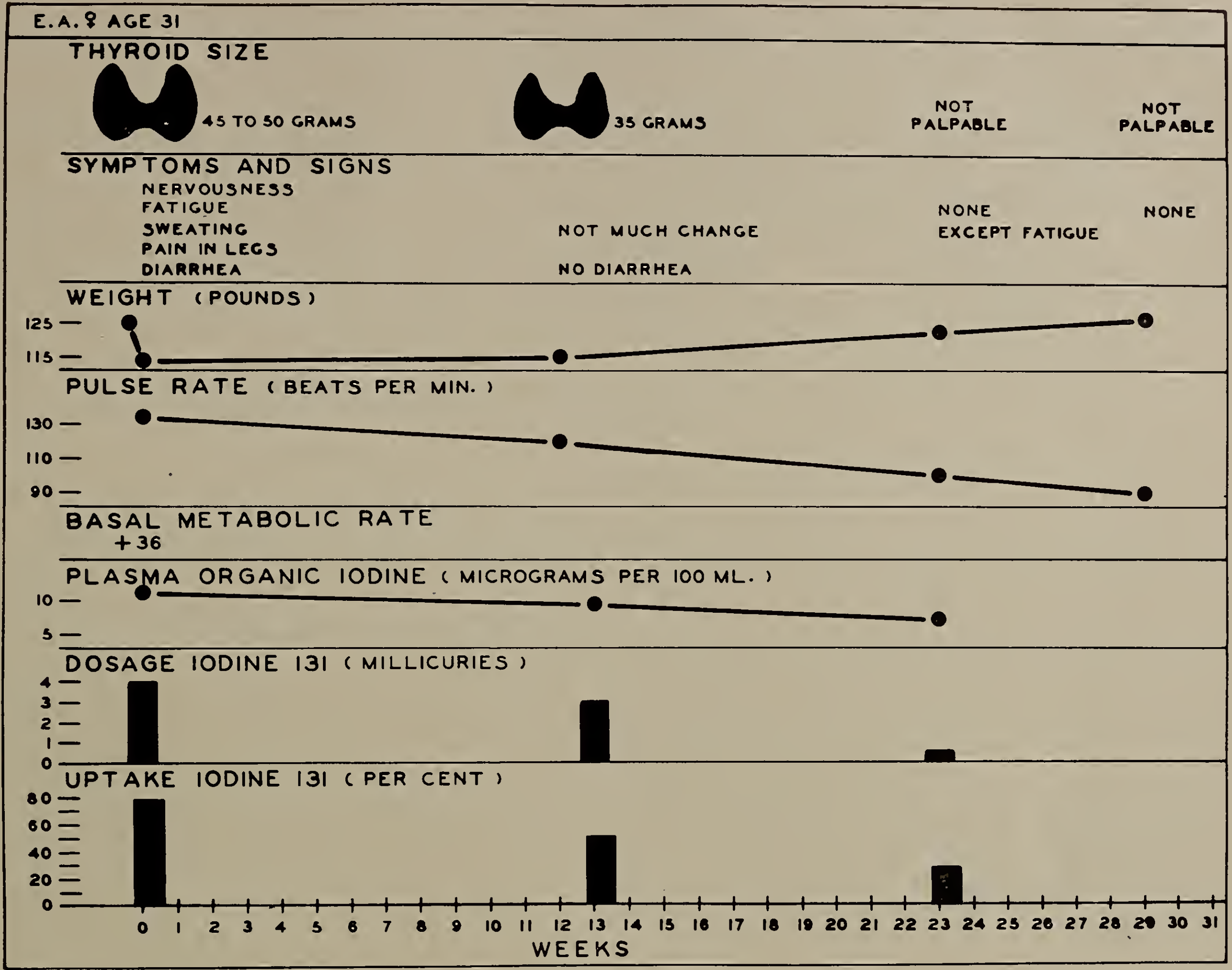

Figure 3.—Representative uncomplicated case of Graves' disease treated with I_{131}. Note correlation of decrease in gland size, increase in weight and well-being, decline of basal metabolic rate and organic iodine in the plasma to normal levels and decreased iodine uptake values as determined by Geiger counts.

mated weight of 45 to 50 gm. The pulse rate was 134, basal metabolic rate plus 36, and plasma organic iodine 11.0 micrograms per 100 cc.

On March 20, 1947, 4.0 millicuries of I^{131} was given, with an uptake by the thyroid gland of 77 per cent. Three months later 3.0 millicuries of I^{131} was given, with an uptake of 50 per cent. In September of 1947 0.5 millicurie was given with an uptake of 27 per cent. Organic iodine in the plasma at this time was 7.0 micrograms per 100 cc. and the thyroid gland was no longer palpable. On final examination in October, 1947, the pulse rate was 90, the patient had gained 12 pounds, and was symptom-free.

Of the 44 patients treated and followed for a year or longer, one developed definite symptoms of myxedema and three developed temporary hypometabolism with return to normal in two to four months. One such case is described in the following case report and in Figure 4. No other complications have occurred to date.

CASE REPORT

A 31-year-old white female complained of dyspnea, palpitation, oligomenorrhea, nervousness, tremor, and loss of weight. Examination revealed an enlarged thyroid gland with an estimated weight of 40 gm. The pulse rate was 126, the basal metabolic rate plus 54, and plasma organic iodine 12.6 micrograms per 100 cc.

The patient was given 3.0 millicuries of I^{131} in May 1947 with an uptake by the thyroid of 62 per cent of the administered dose. The following August, iodine in the plasma was 4.9 micrograms per 100 cc., the thyroid gland was no longer palpable, the pulse rate was 85, the patient had gained 11 pounds, and was symptom-free.

In October 1947, the patient complained of fatigue, sleepiness, cold, constipation, menorrhagia, and falling hair. At this time the pulse rate was 80, the basal metabolic rate minus 14, the plasma iodine level 1.8 micrograms per 100 cc. Improvement followed the administration of thyroid extract, and when last seen in January 1948 the patient was free of symptoms.

THYROIDITIS

Measurement of the uptake of radioactive iodine by the thyroid gland may be of great value in the diagnosis of those cases of thyroiditis with clinical pictures suggestive of hyperthyroidism. Although the diagnosis is usually fairly simple, in some cases the condition can easily be confused with Graves' disease in that the symptoms and laboratory findings are identical in many respects. For example, patients with thyroiditis may have symptoms of nervousness,

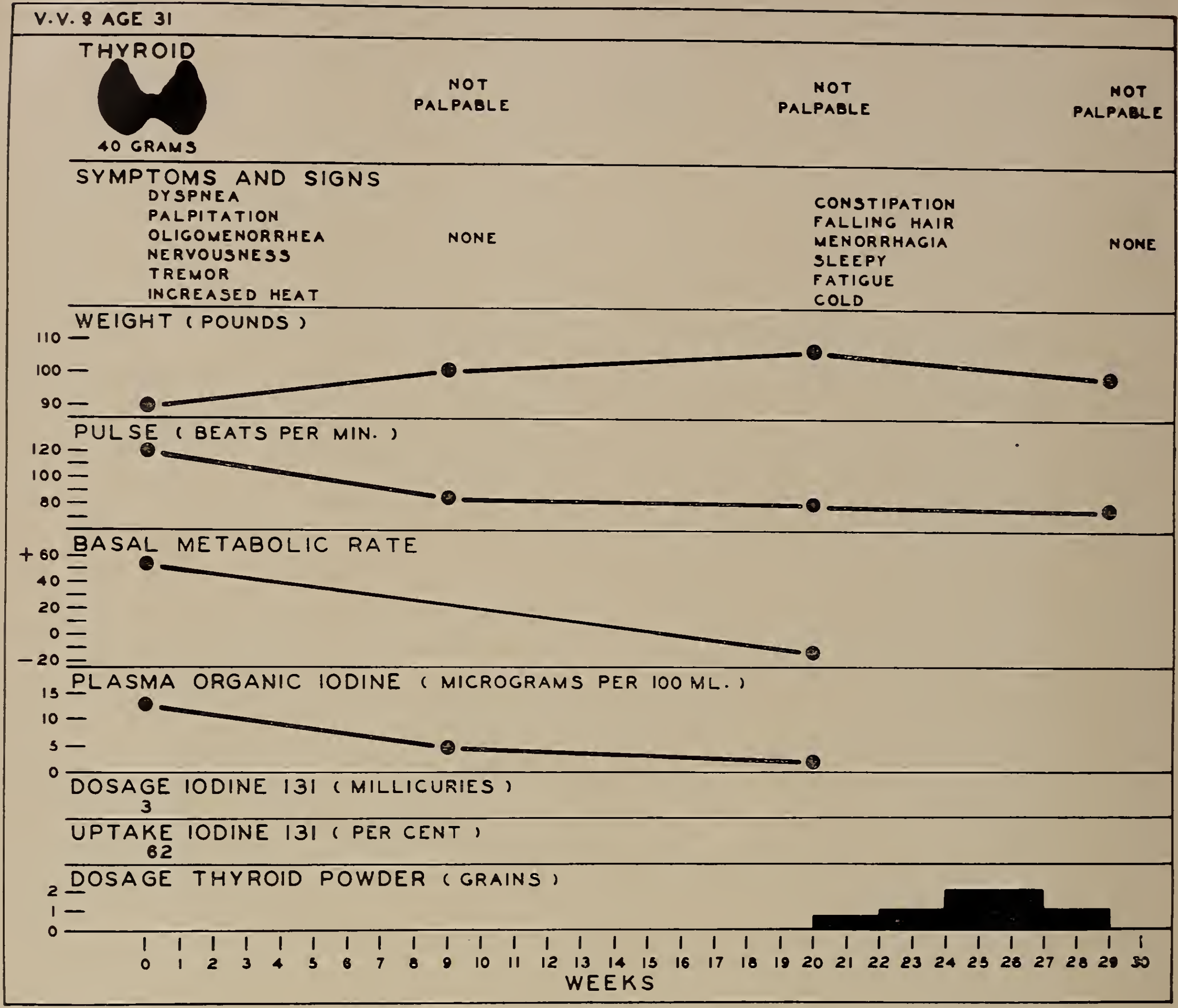

Figure 4.—Illustrative case of temporary hypometabolism resulting from overtreatment with I_{131}. Note that administration of thyroid extract was necessary for only nine weeks, after which time the gland resumed normal function.

tremor, tachycardia and enlargement of the thyroid gland. Also, the basal metabolic rate and serum organic iodine level may be elevated in these patients. It was surprising to find that the thyroid gland in these cases of thyroiditis retained only slight amounts or none of a given dose of radioactive iodine. It was subsequently learned on personal communication with Dr. Mayo Soley of San Francisco that well over a hundred such cases have been studied in his clinic with similar findings. We have seen only four such cases. Since in all patients with thyrotoxicosis the iodine uptake by the thyroid gland is above normal, the measurement of the amount of iodine retained by the thyroid gland in thyroiditis may furnish valuable information relative to the proper diagnosis of this condition. One case is cited below:

CASE REPORT

A 35-year-old white female with illness of one month's duration which had begun acutely with sore throat and fever up to 103° F., was given sulfadiazine without response. There was rapid decline in body weight and the patient complained of extreme nervousness, fatigue to the point of exhaustion, palpitation, sweating, and pain in the region of the heart. Swelling began on the left side of the thyroid gland but disappeared only to appear on the right side. Because asthenia and apprehension were so great that she could not walk without support, the patient was hospitalized. Examination showed a pulse rate of 140, systolic heart murmurs, tremor, warm flushed skin and a firm, swollen thyroid gland which was tender on the right. The basal metabolic rate was plus 32 and the plasma iodine level was 13.9 micrograms per 100 cc. Leukocytes numbered 10,550 and the blood sedimentation rate was 56 mm. in one hour. A diagnosis of thyrotoxicosis with acute onset was made by the patient's physician. The iodine uptake was nil, an observation which was inconsistent with the values obtained in untreated cases of hyperthyroidism. For this reason, the clinical picture was reevaluated and it became apparent that this patient had thyroiditis. Upon treatment with thiouracil, symptoms promptly disappeared.

DISCUSSION

Radioactive iodine appears to be a very effective therapeutic agent in the management of all patients with thyrotoxicosis, including those with complications of various types. It is not recommended in patients with nodular goiters, and, like any other form of therapy, it has advantages and disadvantages. The advantages are:

1. The absence of any mortality directly due to radioiodine. In contrast, the lowest reported mortality from thyroid operations in the postoperative period is 0.5 per cent[3] and in most institutions is probably higher.

2. As opposed to operations also, radioiodine can be administered to the ambulatory patient without loss of time from work. As to a comparison with treatment with antithyroid drugs, the patient does not need repeated blood counts and daily medication, nor is he subjected to the risk of agranulocytosis. Even with propylthiouracil, toxic reactions are reported in 1.6 per cent of the cases.[1]

3. Although radiation sickness has been reported, this has occurred only with larger doses employing another radioactive iodine isotope, I_{130}, and we have not observed this untoward reaction with the use of I_{131} in any of our patients.

4. The cost to the patient of treatment with radioactive iodine is much less than the cost of surgical treatment.

5. The administration of radioactive iodine is not followed by such complications as hypoparathyroidism, severe thyroid storms, postoperative pneumonia or shock, agranulocytosis, laryngeal paralysis, unsightly scars, and emotional strain of a major surgical procedure.

6. So far evidence points to a lesser incidence of progressive exophthalmus among patients treated with radioactive iodine than among those operated upon.

The disadvantages are:

1. The correct dosage of radioactive iodine is not accurately known. As a result, in some cases many months of treatment are necessary before remission is achieved. In other cases too much iodine has been administered, with resulting hypothyroidism. As further experience accumulates it should be possible to gauge more accurately the dosage so that the number of inadequately treated and overly treated cases will be reduced.

2. There are certain unknown dangers from radiation. Although no complications have yet been seen in our cases or reported in the literature, the theoretical possibility exists that some dangers may be present.[6, 7]

3. Whereas with operation the histologic structure of the gland can be accurately appraised, this is impossible if treatment is with radioactive iodine.

4. A certain amount of technical skill and apparatus is required to administer I_{131} properly and safely.

5. Radioiodine has been used only since 1942, is therefore a relatively new form of treatment and unforeseen difficulties may occur as in the case of any new therapeutic agent.

The authors desire to thank Drs. M. H. Soley and E. R. Miller for invaluable aid in conducting this study.

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The Diagnosis of Intestinal Obstruction in the Newborn

A Review of the Literature with a Report of Eight Additional Cases

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SUMMARY

Because the clinical appearance of newborn infants having intestinal obstruction is disarmingly normal, vomiting is reason for immediate search for the cause. To this end the character of stools and meconium that are passed should be carefully observed, lest valuable time elapse before correct diagnosis is made.

In three cases of volvulus observed by the authors, there was moderate to pronounced distention of the abdomen at birth—a sign which may be helpful in diagnosis.

Roentgenograms are the most helpful diagnostic aid. Since the roentgenographic appearance of the normal infant abdomen differs from that of the adult, interpretations should be made with that in mind. In this connection the absence of gas shadows is significant. Although there are dangers in the use of barium in infants, early diagnosis is so important that use of the substance is justifiable if it will help in correct appraisal.

The treatment is always surgical, and the procedure of choice is primary anastomosis. Proper preoperative and postoperative care and treatment, including maintenance of fluid and electrolyte balance and blood volume, are of great importance.

Among the 8,305 live births at Mary's Help Hospital during the past five years, there were seven cases of intestinal obstruction which developed during the first five days of life. Four of these cases were the result of single or multiple atresia of the bowel; and three, of volvulus. This is a considerably higher incidence of atresia than has been reported by others. Webb and Wangensteen[12] reported that atresia occurred in one in every 20,000 births. Besides these seven cases, another, one of congenital atresia, is included. (The baby was delivered elsewhere but treated at Mary's Help Hospital.) Since the mortality in this condition is appallingly high, it was felt that an analysis and review of the eight cases might be profitable (see Table 1). Except in one case of volvulus, the general clinical appearance of the patients was strikingly normal, so that in some instances the diagnosis was not suspected until persistent vomiting and failure to pass meconium had occurred.

The most common site of congenital atresia is the lower ileum. In Ladd's[7] 52 cases, the atresia was located in the ileum in 34; in Davis and Poynter's[2] series of 392 cases, the ileum was the site in 101. The next most common site is the duodenum. Atresia can also exist in the large bowel; in one series[2] it was found to occur there in about ten per cent of the cases. Frequently, these intestinal atresias are multiple. Davis and Poynter[2] in a series of 392 cases found multiple atresias in 15 per cent; Ladd[7] in his group of 52 cases found five per cent of the patients had multiple atresias. In about ten per cent of the cases other embryological defects are present, the most constant being an imperforate anus.[11] Other anomalies frequently associated with this condition are congenital cystic kidneys, malformations of the extremities, and congenital heart disease.

In the three cases of volvulus treated by the authors, the small intestine alone was involved. The rotation was in a clockwise direction, which is usually the case. In each of these cases the bowel was fixed in this position by numerous adhesions to adjacent structures.

DIAGNOSIS

Persistent vomiting in the newborn and failure to pass a normal stool should lead to suspicion of an anomaly of the bowel. Although intestinal obstruction is nearly always due to either congenital atresia or volvulus, vomiting due to other causes, such as intracranial lesions, enteral or parenteral infections, pyloric stenosis, pancreatic achylia, and paralytic ileus must be differentiated. Ordinarily the vomiting of pyloric stenosis commences in infants at the age of two weeks or later, but a few cases have been reported in which the vomiting occurred immediately after birth.[8] A very few cases of vomiting due to inspissated meconium resulting from pancreatic achylia have been reported.[5] In these cases, congenital stenosis of the pancreatic ducts was responsible. Adynamic or paralytic ileus is exceedingly rare in the newborn, but three cases have been reported in which vomiting was of that origin.[9] Whether or not the vomitus is bile-stained will depend upon the location of the lesion in relation to the ampulla of Vater. The vomitus usually contains no bile if the occlusion lies above or at the

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level of the ampulla; however, occasionally, bile may seep through a tiny orifice. Although in the infrapyloric occlusions the vomitus contains bile, the presence of this substance may be difficult to recognize. The time of the onset of vomiting after birth has proven to be of little aid in determining the site of obstruction, for with air and digestive juices added to the amniotic fluid swallowed *in utero*,[6] the infant may start vomiting early even with a low obstruction. For example, in one of the cases of volvulus of the lower jejunum observed by the authors, vomiting began eight hours after birth, whereas in a case of duodenal atresia, vomiting did not occur until the fourth day.

The character of the stool may also be misleading. In four out of five of our cases of atresia the infants passed stools. In the fifth case, in which stools were absent, the patient had a complete rectal atresia associated with a duodenal stenosis. The color of the stools was green in three, and grayish in the fourth, but the consistency and gross appearance in all four cases were mucoid and the amount was scanty. Unfortunately no tests for bile were performed. That bile-tinged meconium can be passed despite complete obstruction below the ampulla of Vater was first reported by Cordes[1] in 1901. The possibility that these atresias develop after the fifth fetal month, when bile is normally present in the intestines, has been suggested by Wangensteen.[11] In contrast to those with atresia, none of our patients with volvulus passed stools. A very useful aid in establishing the diagnosis of intestinal atresia is the Farber test.*[6]

As was stated previously, the clinical appearance of infants with intestinal obstruction is anything but alarming. Most of those observed by the authors appeared to be in good nutritional condition. Even an infant with volvulus and complete gangrene of one bowel segment did not appear unusually ill. Distention in the group of patients with atresias was variable. In general it was not pronounced except in the infant with jejunal atresia. However, distention was a striking feature and was noted at the time of delivery in all the three cases of volvulus. This finding of distention may be a useful aid in differentiating volvulus from congenital atresia. Imperforate anus and rectal atresia, which so commonly complicate obstructions at higher levels, must be definitely ruled out. Digital examination is not entirely satisfactory for this purpose, and attempts to ascertain the patency of the rectum by probing with a catheter also may be unreliable, as the normal folds of the rectum may block the passage of the catheter. In several instances the authors, finding difficulty in passing a catheter, suspected rectal atresia, a suspicion that was quickly dissipated when a thin barium enema was given.

By far the most helpful diagnostic aid is the x-ray examination. Many observers[4] believe that a plain film of the abdomen gives sufficient information as to the presence of these anomalies. Others[9] with equal experience resort to the use of thin barium mixtures, both by mouth and rectum, when conclusive evidence cannot be derived from the plain abdominal film; and they feel that the danger of aspiration of the barium mixture has been exag-

TABLE 1.—*Eight Case Reports in Tabular Form*

Cases	*Character and Time of Vomiting*	*Stools and Character*	*Abdominal Distention*	*X-Ray Findings*	*Surgical Procedure*	*Surgery Day*	*Postoperative Progress*	*Autopsy Findings*
CASE 1: Rectal atresia, duodenal stenosis	Bile-stained second day	None	Moderate on second day	Gas with distention in duodenum	Pull-through	Third	Vomiting; expired on seventh postoperative day	Duodenal stenosis
CASE 2: Duodenal atresia	Green, frothy fourth day	Daily from birth, green-yellow	Minimal	Gas with distention in duodenum	Duodenal jejunostomy	Eighth	Survived for 51 days; diarrhea	Severe inanition; anastomosis intact
CASE 3: Multiple atresia	Yellowish 12 hours after birth	None	None	Like a high bowel obstruction	Side-to-side	Fifth	Expired fifth postoperative day; vomiting	
CASE 4: Jejunal atresia	Bile-stained second day	Green mucus fourth day	Marked on second day	Small intestine distended	Side-to-side anastomosis	Sixth	Expired on second postoperative day	Rupture of anastomosis with peritonitis
CASE 5: Volvulus, lower jejunum and upper ileum		None	Moderate at birth	Many distended loops	Freeing adhesions; release of volvulus	Third	Good	
CASE 6: Volvulus, jejunum	Grayish-green 8 hours after birth	None	Moderate at birth	A few distended loops	Resection side-to-side	Third	Expired in 26 hours	Anastomosis intact; duodenum and first part of jejunum dilated
CASE 7: Volvulus, small intestine	Suction since birth	None	Marked	Absent gas shadows	Freed adhesions; release of volvulus	Third	Stormy; died fourth postoperative day	Peritonitis; partial recurrence of volvulus
CASE 8: Ileal atresia	Green-stained mucus	Green-stained	Moderate	Distended loops	End-to-side	Fourth	Good four days; died seventh postoperative day	Leak at anastomosis; localized peritonitis

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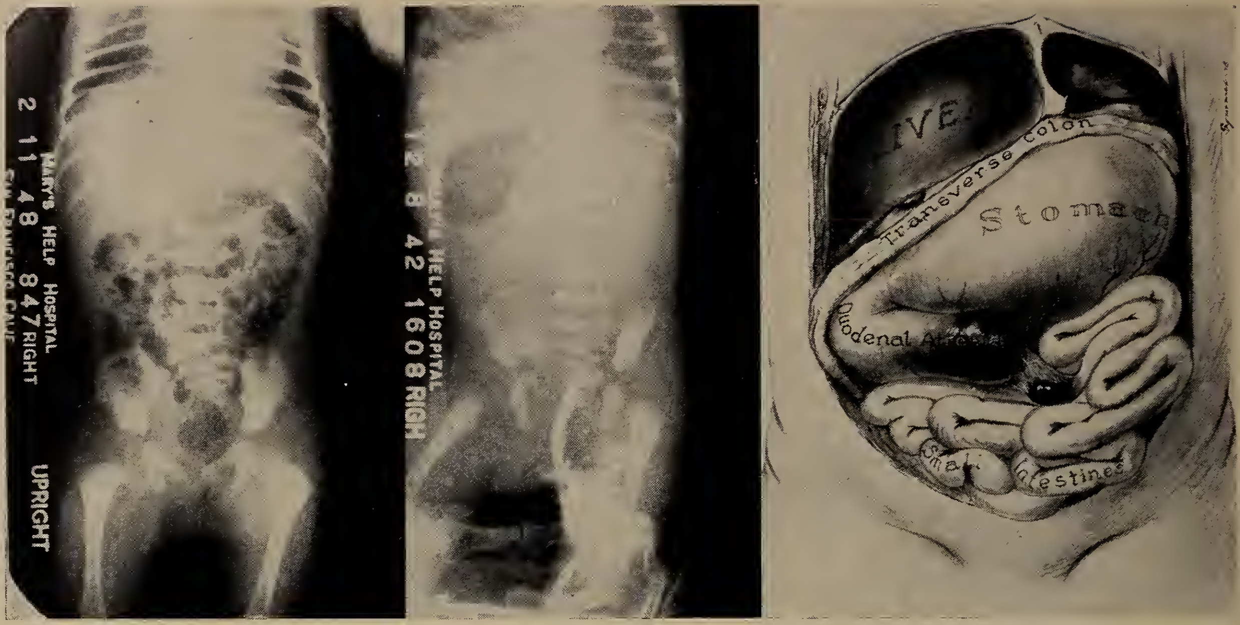
*This test consists of examining a thin stained smear of the meconium for the presence of cornified epithelial cells which the fetus had ingested when swallowing amniotic fluid. The presence of these cells in the meconium indicates patency of the intestinal tract, while their absence indicates, quite definitely, a complete obstruction.



A B C

Figure 1. A—Flat plate of abdomen of normal infant. B—Duodenal atresia. C—Duodenal atresia, operative findings.

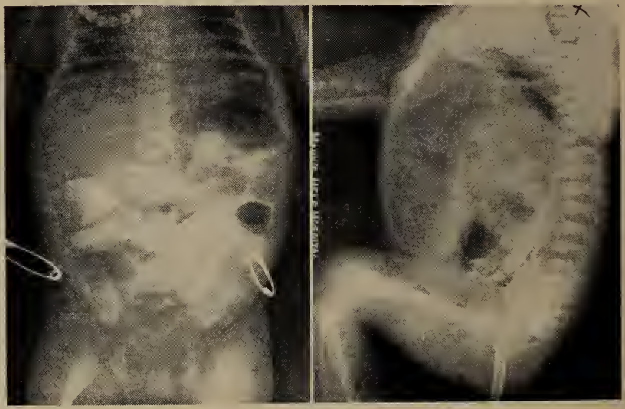
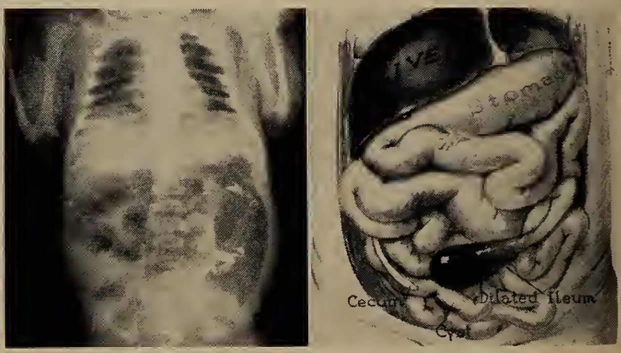


Figure 2.—Jejunal atresia, anterior-posterior and lateral views.



A B

Figure 3. A—Ileal atresia. B—Operative findings in Case 8 (Table 1).

gerated. The normal x-ray appearance of the infant abdomen differs considerably from that of the adult. In the adult abdomen, in the absence of obstruction, air is present only in the stomach and colon, whereas in the infant (Figure 1-A) air is normally present throughout the small intestines up to the age of two years. Therefore, in the infant, the absence of intestinal gas shadows is suggestive of obstruction.

In the case of duodenal atresia observed by the authors (Figure 1-B and C), the duodenum was considerably distended with gas, while there was no evidence of gas in the remaining small intestine. In a case of jejunal atresia, on the other hand, the small intestine was shown to be distended with gas (Figure 2). A lateral view showed one loop of intestine which was so distended that it was suspected of being large bowel. At operation this was found to be the terminal portion of the distended jejunum. The x-ray film of an infant with ileal atresia (Figure 3-A) revealed the small bowel to be similarly distended but a greater number of distended loops were seen, which naturally would be expected. In a case of multiple atresia the x-ray appearance was that of obstruction high in the small bowel. Actually an atresia was found six inches from the ligament of Treitz.

In volvulus gas may or may not pass into and be visualized in the small intestine. The authors believe that the non-passage of gas is dependent upon an associated malrotation of the midgut with resulting obstruction of the duodenum. The x-ray findings and physical signs in Case 7 (Figure 4-A) led to the erroneous diagnosis of abdominal ascites. Abdominal distention was pronounced and flank dullness was present. These observations, taken together with the absence of gas shadows and the increased diffuse density of the x-ray shadow, led to the erroneous diagnosis. However, when the abdomen was opened a volvulus of the lower ileum was found, with the twisted loop and bowel proximal to it filled with a thin meconium. There was no free peritoneal fluid. The absence of gas shadows on the x-ray film in this case was due to the small bowel being filled with meconium. In Case 6 (Figure 4-B) the x-ray film showed a few distended loops on the left side

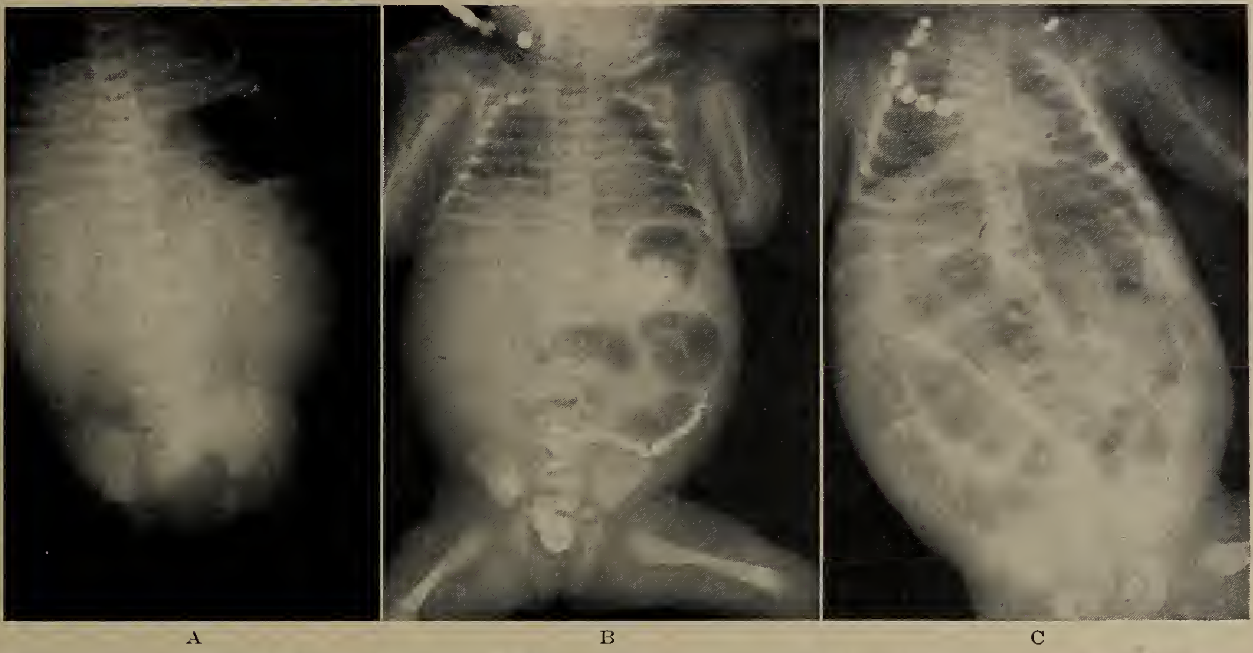


Figure 4. A—Volvulus, showing pronounced abdominal distention and lack of gas. B—Volvulus with distention and moderate amount of gas. C—With distention and tremendous amount of gas.

of the abdomen. In a third case of volvulus, Case 5 (Figure 4-C), in which the patient survived the operation, there was a tremendous amount of gas in many distended loops on the day of birth and on the following day the distention of these loops had increased considerably.

Treatment, obviously surgical, should of course be instituted as early as the condition of the patient permits. The preoperative preparation of the infant is of paramount importance. Restoration of tissue fluids and electrolytes is vital. Transfusions of whole blood are indicated to maintain the normal blood volume. Preoperatively, stomach lavage, using a small-sized rubber catheter, to avoid the aspiration of vomitus during the operative procedure, should be employed. During the operation the catheter is retained to maintain decompression. In atresias the best surgical procedure is considered to be a side-to-side anastomosis of the upper patent segment to the lower patent segment. Intervening segments of bowel in multiple atresias are best left alone, as resection not only is unnecessary but jeopardizes the blood supply of the remaining bowel. Enterostomy should never be considered. In volvulus considerable dissection may be necessary to free and restore the bowel to its normal position.

PROGNOSIS

Until recently the outlook for infants with bowel obstructions of the kind under discussion was exceedingly poor. In a total of 500 cases reported up to 1931 there were only nine patients who survived operation,[12] and before 1942 there were no survivals from operations for multiple atresia.[3] Infants with an untreated complete atresia have been known to live as long as three weeks, but death usually occurs within six days after birth. In several instances in which the stenosis was incomplete, the infants have lived to maturity.[3] With earlier diagnosis, improved surgical technique and suture material, and the highly effective chemotherapeutic and antibiotic drugs, there have been many more survivals in the last few years. In 1947 Potts[10] reported five cases of atresia with four survivals, including the first recorded survival following operation for atresia of the transverse colon.

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Hemolytic Anemias

Recent Advances in Diagnosis and Treatment

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SUMMARY

The hemolytic anemias of unknown cause can be separated into two main groups: (1) those produced by a defect in cell structure, which is usually hereditary, and (2) those due to a hemolysin of immune-body type.

The hemolytic anemias associated with hypersensitivity to drugs and disease processes such as leukemia are less well understood and need further investigation.

Splenectomy is the only effective treatment in congenital hemolytic jaundice and in acquired hemolytic anemia; the operation should be carried out promptly in most cases. Transfusion may be used in all varieties of hemolytic disease and is the only effective form of therapy in sickle-cell anemia and paroxysmal nocturnal hemoglobinuria.

ACCELERATED destruction of red blood cells, regardless of causation, is characterized by clinical and laboratory findings which can be listed as follows:

1. The erythrocyte count, hemoglobin and hematocrit fall until the bone marrow, working under increasing stimulus, produces new cells fast enough to keep pace with the accelerated destruction. A balance in the opposing processes may not be reached at a level of hemoglobin high enough to support life.

2. Increased blood formation as evidenced by polychromatophilia, reticulocytosis, and the presence of nucleated red blood cells is the characteristic finding in the peripheral blood.

3. There is an increased formation and excretion of hemoglobin breakdown products in the stool in the form of urobilin and urobilinogen. Some degree of hyperbilirubinemia always results from the additional bilirubin formed, but clinical jaundice is by no means a constant finding in hemolytic anemia. Bile does not appear in the urine, although the amount of urobilinogen in the urine is almost always increased.

CLASSIFICATION OF THE HEMOLYTIC ANEMIAS

Observations of the longevity of transfused cells and recently developed methods for detecting the presence of hemolytic antibodies now permit the division of the hemolytic anemias into three main groups:

A. Hemolytic anemia due to abnormality of the cell.
  1. Congenital hemolytic jaundice.
  2. Sickle cell anemia.
  3. Paroxysmal nocturnal hemoglobinuria (hemoglobinemia).
  4. Mediterranean anemia.

B. Anemias due to an immune body type of hemolysin.
  1. Acquired hemolytic anemia.
  2. Hemolytic disease of the newborn.
  3. Paroxysmal hemoglobinuria.

C. Hemolytic anemia associated with extrinsic factors or disease states.
  1. Parasitic infections of the red blood cells (malaria, aroya fever).
  2. Action of lytic substances (B. welchii toxin, phenylhydrazine).
  3. Hypersensitivity to drugs (sulfanilamide) or to other substances (favism) or to infectious processes (blackwater fever).
  4. Association with disease states but cause undetermined (lymphoma, leukemia, metastatic cancer).

CONGENITAL HEMOLYTIC JAUNDICE

In most cases the diagnosis of congenital hemolytic jaundice is clear-cut. In addition to the usual signs of accelerated blood destruction, the patient has a past history of subnormal energy and endurance since early childhood, and jaundice and anemia with periodic exacerbations may have been noted. There may be overt signs of hemolytic anemia in other members of the family, or examination of the blood of relatives may show the tendency toward spherocytosis of the erythrocytes and the increase in osmotic fragility that is characteristic of the disease.

The structural defect in the red cell which produces the tendency toward spherocytosis is not known, but Emerson and co-workers[12] have recently demonstrated that the erythrocytes from patients with this disease are particularly susceptible to stasis both in test tube experiments and in the spleen. Stasis produced a prompt increase in spherocytosis and a consequent increase in the osmotic and mechanical fragility which were not observed in

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normal cells. Following splenectomy there is a disappearance of the most fragile cells and a return toward normal values for osmotic fragility. Normal cells, given to a patient with congenital hemolytic jaundice, did not share in the abnormal hemolysis and survived a normal length of time in the patient's circulation, as first shown by Dacie and Mollison.[6] Normal cells also showed no increase in osmotic and mechanical fragility after exposure to the patient's circulation.

The mechanism of the crisis in this hemolytic disease is still obscure. It has always been assumed that the abdominal pain, fever and increase in the anemia were due to a sudden acceleration of blood destruction. Owren[25] has recently thrown doubt on the hemolytic explanation of the crisis by demonstrating an aplasia of the marrow and a low reticulocyte count for a period of 10 to 14 days after the crisis. He believes that the rapid development of anemia is due to sudden decrease in blood formation. Others have observed the lack of rapid blood regeneration following the crisis but have attributed the symptoms and rapid increase in anemia to acceleration of the abnormal destruction. It is possible to be misled by the temporary absence of reticulocytes in patients who otherwise appear to have had a crisis of congenital hemolytic jaundice. However, we have observed a hemolytic crisis in a male, age 25, following transfusion, which was not associated with marrow hypoplasia, since the reticulocyte count remained between 10 and 17 per cent. Chart 1 shows that the transfused normal cells did not become involved in the abnormal hemolysis even during the crisis.

There is general agreement that splenectomy is highly effective in the treatment of congenital hemolytic anemia. During the last three years we have studied six individuals with this disorder who have had splenectomy. There has been a prompt and complete clinical remission in all cases and a tendency for a shift toward normal in the curve of hypotonic fragility. It seems clear that the spleen exerts its hemolytic effect by providing the principal site for stasis of the red cells and the development of fragile spherocytes. The time when splenectomy should be performed is largely optional, since, typically, the course is mild and even during and following a crisis the anemia does not threaten the patient's life. On the other hand, there is no point in permitting the patient to remain chronically ill for years when splenectomy would result in cure of anemia.

SICKLE-CELL ANEMIA

Since sickle-cell anemia is said to afflict about 1 per cent of all members of the Negro race, the disease should be suspected whenever anemia is observed in a Negro patient. Diagnosis is important and sometimes difficult, since the symptoms of sickle-cell disease may closely simulate those of rheumatic fever or intra-abdominal emergencies. On the other hand, not all anemias in Negro patients should be assumed to be due to sickle-cell disease, even if sickling is demonstrated, since the incidence of the sickle-cell trait is about 10 per cent.[10] The patient should show the cardinal signs of hemolytic anemia and sickling of the erythrocytes should occur readily in high percentage when exposed to decreased O_2 tension.

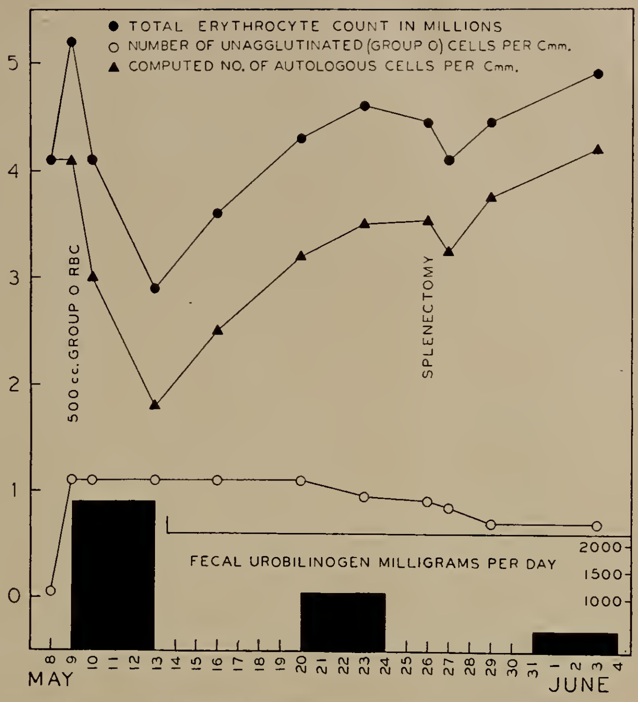

Chart 1.—Congenital hemolytic jaundice. Hemolytic crisis beginning 24 hours after transfusion of 500 cc. of Group O cells. The transfused erythrocytes did not share in the hemolytic process that reduced the erythrocyte count by over two million in three days. Studies of hypotonic fragility before and after the transfusion indicated that the transfused normal cells retained their normal morphologic structure and normal hypotonic fragility.

The chronic hemolytic anemia and the sudden hemolytic crisis are due to the sickling of erythrocytes in capillaries and venules which produces obstruction to the flow of blood and even thrombosis.[23] Fragmentation of the sickled red cells occurs largely as a result of stasis and increased mechanical fragility which results from the abnormal shape. In demonstrating the sickling the best results are obtained by first producing lowered O_2 tension in capillary circulation by placing a tourniquet on the finger for five minutes. A drop of whole blood is then sealed under a cover slip or a hanging drop preparation. Sickling of 90 to 100 per cent of the cells should take place rapidly under these conditions.

At present little can be offered to the patient with sickle cell disease in the way of sustained therapy for either the chronic forms or the hemolytic crisis. Much can be accomplished with transfusions if the necessary blood, particularly concentrated red cells, is available. Transfused normal cells do not become involved in the hemolytic process and therefore exhibit a normal survival time.[1] Building up the patient's blood count to a normal level with multiple transfusions has the effect of slowing down the rapid blood regeneration and replacing the patient's abnormal cells with normal red cells. When this is accomplished, the signs of rapid hemolysis may diminish abruptly as shown in Chart 2.

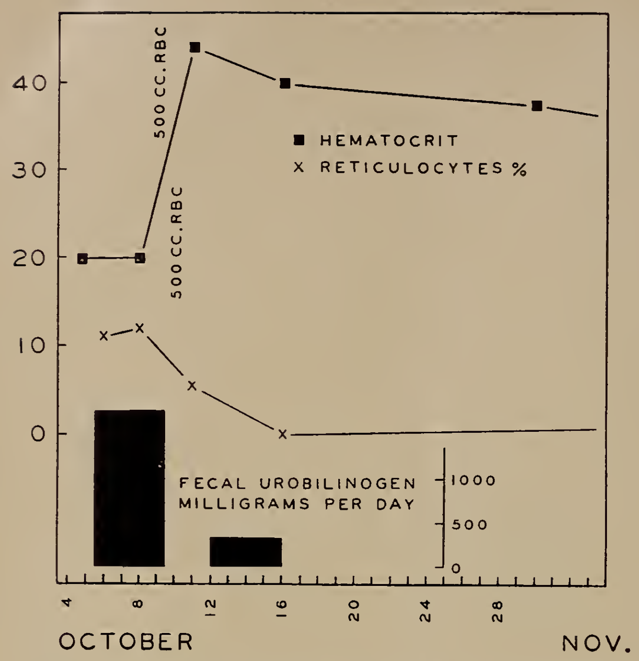

Chart 2.—Sickle cell anemia; demonstrating the marked reduction in rate of hemolysis following multiple red cell transfusions which temporarily eliminated the anemia and reduced the reticulocyte count to normal. The cells susceptible to sickling were 95 per cent before transfusion and 10 per cent during the remission in hemolysis following transfusion.

CASE REPORT

The patient from whose record Chart 2 was drawn was a 16-year-old Negro girl who was known to have had sickle-cell anemia for six years. She had also had migratory pains in the arms and legs, and because of cardiac enlargement and a rough systolic murmur the diagnosis of rheumatic fever had also been entertained. Signs of hemolytic anemia were exhibited and the liver was enlarged but the spleen was not palpable. Hematocrit reading showed packed red cells 21 per cent of the whole blood, the hemoglobin 7.5 gm. per 100 cc., and the red cells 2.15 million per cmm. with 10 per cent reticulocytes. In a sealed preparation, obtained after stasis, 95 per cent of the cells showed sickling. Following the administration of multiple red cell transfusions, the hemoglobin was 14.5 gm. per 100 cc. and red cells were 43 per cent of the whole blood. The rate of blood formation returned to normal, and the fecal urobilinogen fell to 315 mg. per day from 2,000 mg. per day. The patient was no longer icteric and appeared entirely well. Sealed preparations of blood showed only 10 per cent sickling. Transfusions of 500 cc. of red cells every three or four weeks were sufficient to keep circulating hemoglobin close to a normal level.

It is admittedly difficult and expensive to give the amount of blood necessary to alleviate this disease over a long period. However, multiple transfusions sufficient to eliminate anemia appear to be an excellent way for preparing a patient with sickle-cell anemia for operation or delivery. Reduction of the number of cells susceptible to sickling to 10 per cent, as was observed in our patient after transfusion, probably eliminates the possibility of a hemolytic crisis during a surgical procedure or an acute infection.

PAROXYSMAL NOCTURNAL HEMOGLOBINURIA

In this rare variety of chronic anemia the erythrocytes have acquired a susceptibility to destruction by a hemolytic system which occurs in normal serum. Ham[17] demonstrated that the hemolysin is activated *in vitro* by lowering of the pH of plasma or serum, within physiological limits, by equilibration with CO_2 or acidification with mineral acids. In the patient hemolysis occurs most actively at night in the peripheral circulation so that hemoglobinuria occurs and hemoglobin usually appears in the morning urine. The explanation offered for the nocturnal peak of hemolysis is the lowering of the pH of the blood due to the accumulation of CO_2 during sleep, particularly in certain parts of the circulation.

A patient with this disease shows the cardinal features of chronic hemolytic anemia and in addition usually is alarmed by the passage of red urine, particularly in the morning. There is an absence of spherocytosis and the osmotic fragility of the red cells is normal. A simple, presumptive test for acid hemolysis is described by Hegglin and Maier[20] which consists in incubating a sealed tube of clotted blood at 37° C. A positive reaction results from hemolysis of susceptible cells as CO_2 accumulates during incubation. Normal blood and blood from patients with other varieties of hemolytic anemia do not show hemolysis under similar conditions unless, as we have observed, an extreme degree of spherocytosis exists. If the result of the presumptive test is positive, the more elaborate techniques described by Ham[17] should be carried out.

Active treatment of the disease is considered futile, since the patients do not respond to splenectomy. Administration of alkali, such as sodium bicarbonate, only temporarily delays hemolysis. However, as in sickle-cell anemia, transfusions are of considerable benefit, since the transfused cells do not become involved in the hemolytic process and exhibit a normal longevity.[7] For one patient with this disease who has been under observation for a number of years, regularly administered transfusions have been very beneficial:

CASE REPORT

The patient, a 53-year-old woman of Portuguese extraction, was first admitted to hospital in August, 1945, with severe anemia of undetermined cause. She had been found to be anemic about one year previously but there was no response to iron or liver therapy. Jaundice and hematuria had not been noted. The patient was obese and pale, but icterus of sclerae was not observed. The spleen was not felt. Packed red cells made up only 16 per cent of the whole blood, hemoglobin was 4.8 gm. per 100 cc., and erythrocytes numbered 1.7 million with 9 per cent reticulocytes. Leukocyte counts averaged 3,000 with a normal differential. The icteric index was 10 units. There was no spherocytosis or increase in hypotonic fragility, and sickling was absent.

Incubation of a sealed tube of the patient's blood at 37° C. overnight turned the serum surrounding the clot dark red with hemolysis. Red cells and serum were prepared from normal blood and the patient's blood by defibrination with glass beads. Ten per cent suspensions of cells in serum were mixed and equilibrated with air or CO_2 and then incubated for one-half hour at 37° C. Following centrifugation the supernatant serum was inspected for hemolysis.

	Cells	Serum	CO_2 or Air	Hemolysis
1	Patient's	Patient's	CO_2	+++
2	Patient's	Normal	CO_2	+++
3	Patient's	Patient's	Air	0
4	Patient's	Normal	Air	0
5	Patient's	Inactivated	CO_2	+
6	Normal	Patient's	CO_2	0
7	Normal	Normal	CO_2	0

These observations have been repeated on many occasions with closely similar results. Samples of blood collected at 2 a.m. have shown free hemoglobin in the plasma and serum although hemoglobinuria did not follow in the morning. Hemosiderin has been present in the urine on all examinations.

Studies of the excretion of fecal urobilinogen during 20 days of observation showed a fairly constant rate of 600 to 800 mg. per day. The patient was then given a transfusion of 500 cc. of concentrated red cells which did not produce immediate reaction, but two days later the temperature rose to 39.1° and hemoglobin appeared in the urine for the first and only time. In the succeeding two days two more transfusions were given, one of 500 and the other of 700 cc. of red cells, without reaction or recurrence of hemoglobinuria.

Following the third transfusion red cells were 45 per cent of the blood volume, and the red cell count and hemoglobin were normal. The reticulocytes fell to 1 per cent and the rate of excretion of urobilinogen in the feces dropped to a range close to normal during the first three weeks. With pallor gone the patient appeared well and said she felt well.

At the end of 45 days the red cell volume had dropped to 31 per cent of the whole blood and some of the pallor had returned. However, transfusions of concentrated cells given in two days restored the blood to normal. The patient has continued to receive multiple transfusions at intervals of 35 to 70 days and has felt well and been ambulatory. During the past year there has been some indication of general improvement in that the rate of fall of the hematocrit is slower now following transfusion than during the first year of treatment. Following the last transfusion it has been demonstrated by technique of differential agglutination that the transfused erythrocytes survived a normal length of time in the patient's circulation, as is shown by line A in Chart 3.

The frequency and severity of hemolytic episodes following transfusion has been noted by many observers. The severity of the reaction probably depends in large part on the number of susceptible cells in the patient's circulation at the time transfusion somehow sets off the increased hemolysis. It would appear that once a hemolytic episode has followed a transfusion, additional blood may be given with little danger of precipitating a similar reaction. The remission in hemolytic activity after transfusion has been noted previously by others. Once transfusions are started it may be possible to keep the hemolytic episodes under control by giving blood at regular intervals, thus preventing the building up of a high percentage of the patient's own cells in the circulation.

In the case reported, the absence of hemoglobinuria except in the one instance following transfusion does not throw doubt on the diagnosis since susceptibility of the patient's cells to acid hemolysis has been consistently demonstrated. Patients with this disease who show morning hemoglobinuria only occasionally have been described.[18] The absence of hemoglobinuria in the presence of hemoglobinemia simply means that the concentration of hemoglobin in the plasma does not reach a sufficient level to exceed the reabsorptive capacity of the renal tubules. Ham has suggested that the name "paroxysmal nocturnal hemoglobinemia" is preferable to "paroxysmal nocturnal hemoglobinuria." The case reported in preceding paragraphs represents a point in favor of the former name.

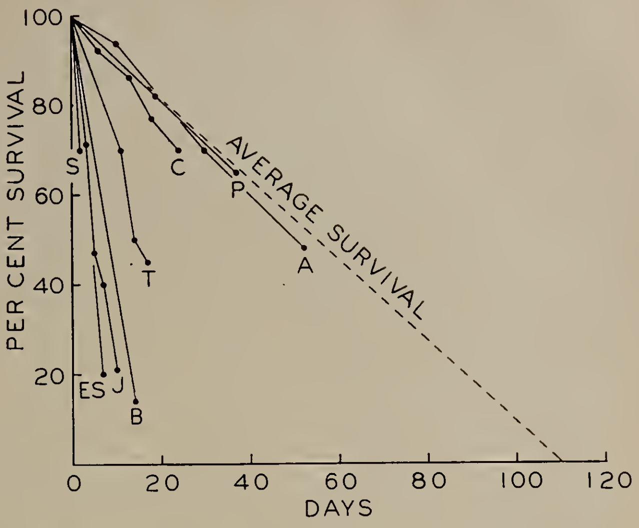

Chart 3.—Measurement of survival time of transfused erythrocytes in various types of hemolytic anemia. Lines labeled S, T, J, B, and ES are representative of acquired hemolytic anemia and show a sharp reduction in the survival time of transfused erythrocytes. Line C (congenital hemolytic jaundice), line P (Cooley's Mediterranean anemia), and line A (paroxysmal nocturnal hemoglobinuria), all show a survival time of transfused cells within the normal range during the period of observation.

MEDITERRANEAN ANEMIA

It is now well recognized that Mediterranean anemia exists in varying degrees of severity and that the milder forms are compatible with adult life.[8] Many patients show evidence of an abnormal hemolytic process with hyperbilirubinemia, increased fecal urobilinogen, and reticulocytosis and nucleated red cells in the peripheral blood. However, other features of the disease may be present in the absence of much evidence of abnormal hemolysis. The most constant characteristics are hypochromia with a low mean corpuscular hemoglobin concentration which does not respond to iron, the decreased cell thickness with increased resistance to hemolysis in hypotonic saline, and the target cell or oval cell deformity of the erythrocytes in a stained smear. The disorder appears to be a hereditary defect in red cell formation, particularly as pertains to hemoglobin synthesis.

Since the disease in general appears to be due to a defect in the red cell, the abnormal hemolysis is probably on that basis. Transfused normal cells should exhibit a normal survival time in patients with this disease. We have observed this to be true in one case as shown in Chart 3. So far hemolytic antibodies have not been observed by any other method of study. Aside from repeated transfusions[21] there appears to be little available in the way of therapy. Splenectomy may lessen the severity of the disease and diminish the frequency of transfusions in some cases.

ACQUIRED HEMOLYTIC ANEMIA

Acquired hemolytic anemia has been recognized as a separate entity on the basis of clinical observations since the first of the century. It is now possible to use laboratory methods as well as clinical evidence to distinguish between acquired hemolytic anemia and other types of hemolytic disorders, so that the syndrome may now be differentiated by the following characteristics:

1. No familial incidence has been noted in our cases nor in series reported by others.
2. The disease may begin in any period of life, and there is usually nothing in the history suggestive of previous hemolytic episodes.
3. The course is acute or subacute in contrast to the usual mild course of congenital hemolytic jaundice.
4. Spherocytosis and consequent increased osmotic fragility may be present, particularly in the severe cases, but it is not a constant feature of the disease.
5. Transfused normal cells become involved in the hemolytic process and are eliminated from the circulation at an accelerated rate.[3, 4, 6, 22]
6. Erythrocytes from patients with acquired hemolytic anemia consistently show evidence of sensitization by an immune body hemolysin,[2, 13, 27] by the Coombs technique.[5] Other observers report consistent demonstration of erythrocyte antibody in the serum.[24]
7. The response to splenectomy is so variable as to constitute a feature of the disease.

Twelve patients with acquired hemolytic anemia studied at Stanford University Hospital during the past six years have exhibited great variation in severity of the hemolytic process. In some cases the disease process has been violent with severe anemia, leukocytosis, fever, and prostration. In others the condition has been insidious in onset and the symptoms have come from the gradual development of moderately severe anemia. The patients have varied in age from 16 to 78 and only two of the 12 were men. In seven of the 12 patients there was no evidence of associated infection or neoplastic disease in the background and no history of drug ingestion or exposure to toxic substances. Of the remaining five, two patients, the youngest in the group, had a preceding or concomitant attack of virus pneumonitis. A third patient was receiving gold therapy for arthritis at the time of the onset of the hemolytic disease but there is no direct proof of etiological relationship. The oldest patient in the group, a man aged 78, was found to have hemolytic anemia in association with chronic lymphatic leukemia. One woman, aged 41, was in the third trimester of pregnancy at the time of onset of thrombocytopenia and hemolytic anemia. In her case the thrombocytopenia continued to overshadow the hemolytic disorder in severity.

Five of the patients did not show clinical jaundice when first seen. Consequently the diagnosis of hemolytic anemia was not entertained until blood studies and measurement of bile pigment excretion proved the hemolytic origin of the anemia. The excretion of urobilinogen in the feces was determined in seven patients, including those who did not exhibit clinical jaundice, and varied from 600 to 2,400 mg. per day. In all patients the icteric index and the plasma bilirubin were at least slightly above the normal level even though jaundice was not apparent. All the patients showed reticulocytosis which varied from 7 per cent to 30 per cent on the first examination. Nucleated red cells were found in the peripheral blood in every case, and sternal aspiration in 11 patients showed hyperplasia of the erythroid elements. The fragility of the erythrocytes in hypotonic saline was definitely increased in seven, but was within normal limits in five patients.

Leukocytosis with counts of 12,000 to 40,000 with polymorphonuclear leukocytosis was encountered in six patients, who in general had the most severe disease. On the other hand, leukopenia with counts varying from 1,700 to 5,000 was found in five patients. Thrombocytopenia was also common, and platelet counts of 60,000 or under were encountered in five patients, but only one patient exhibited a bleeding tendency.

Studies of the longevity of transfused cells by a modification of the Ashbey technique of differential agglutinations were made in five of the 12 patients. In all five the transfused normal cells were eliminated from the patients' circulation at an abnormally rapid rate, as is shown in Chart 3. In four other patients repeated multiple transfusions of red cells had a transitory effect so that it could be ascertained by simple calculation that the transfused red cells were involved in the hemolytic process. In one patient it was demonstrated that the transfused cells showed an increased hypotonic fragility 24 hours after transfusion.

Since the advent of the Coombs test, the nine patients in the group studied with this technique have all shown evidence of sensitization of the circulating red cells by an immune body. A technique for quantitating the amount of antibody on the cell has been devised and there is evidence that the activity of the hemolytic process before and after splenectomy is correlated with the amount of antibody on the cell surface.

The treatment of acquired hemolytic anemia is not as clear-cut as in the previous varieties discussed. In general the course of the disease is usually progressive and shows a tendency to increase in severity. Spontaneous cure of the hemolytic disease was observed in only one instance in a 16-year-old girl with associated pneumonitis. In her case one transfusion did not affect the course of the disease, and the hemoglobin remained at a level of 30 per cent for several days until the pneumonic process subsided. This was followed by a complete and apparently permanent remission in the hemolytic process. A temporary partial remission was observed in one patient who a few weeks later relapsed and underwent splenectomy without improvement. One patient died without splenectomy because of the extreme severity of the disease, and one patient is now under observation and splenectomy has not been performed because of advanced age and complicating lymphatic leukemia.

Nine patients have undergone splenectomy with variable results typical of this type of hemolytic anemia. These patients may be divided into three groups according to their course since splenectomy:

1. Four have exhibited complete clinical remission for periods of from 18 to 24 months. One patient of this group died of metastatic carcinoma without recurrence of the hemolytic process. The patient exhibiting thrombocytopenia and hemolytic anemia during the sixth month of pregnancy showed little change following removal of the spleen although the bleeding tendency lessened. There was a gradual relief of anemia and thrombocytopenia following delivery.
2. One patient had a remission of 18 months following splenectomy but died in relapse.
3. In four, splenectomy was probably of some temporary or lasting value, but the hemolytic process has continued actively. One patient died of anemia and two died of infectious processes not connected with the hemolytic anemia. One patient is alive and ambulatory with chronic hemolytic anemia six years after splenectomy. In her case hemoglobin varies from 45 to 60 per cent.

Methods designed to quantitate the amount of anti-erythrocyte antibody on the surface of the red blood cell indicate that remission following splenectomy is associated with reduction of the quantity of antibody on the cell surface.[14] The reduction occurs immediately after splenectomy, indicating that the spleen is the major source of antibody. Relapse or continuation of the accelerated process is associated with amounts of antibody on the cell comparable to presplenectomy values. Evidently other tissues have assumed a larger role in the formation of the erythrocyte antibody in those cases in which there is either no improvement or relapse. Autopsy examination of two patients who died in relapse failed to reveal an accessory spleen.

The important practical question to be answered is the effect of early splenectomy, as opposed to delay, in the production of complete remission. Our series is small, but there is evidence that in general those patients in whom the disease was mild and who underwent splenectomy promptly after the diagnosis was made, did the best. On the other hand, patients on whom the operation was delayed because of uncertainty and because of the severity of the disease did less well after operation. It is our impression that the severity of the disease has more to do with remission than the time of splenectomy.

We have observed no general contraindications to transfusions in this group of patients and the majority received multiple red cell transfusions without incident during their hospital course. One patient is said to have had a hemolytic transfusion reaction before entering this hospital, which is probable, since hemoglobinemia was present on entry some 24 hours later. Subsequent multiple transfusions were well tolerated although the patient finally died of anemia and renal failure.

It should be kept in mind that these patients may exhibit atypical isoantibodies in addition to the hemolytic antibody causing the disease. They are likely to have cold agglutinins which add confusion to the determination of compatibility of blood. As a consequence it is recommended that in addition to the usual precautions of grouping and Rh typing, the cross-matching of blood be performed with a 2 per cent serum suspension of the donor's cells and a drop of the recipient's serum undiluted with saline. The mixture should be incubated at 37° C. for one-half hour and centrifuged in a warmed cup for one minute before a reading is made. This warm serum cross-match will serve to detect the presence of atypical isoantibodies and will eliminate false indications of incompatibilities due to cold agglutinins. In addition to these steps Hattersley[19] recommends centrifugation of the suspension immediately after mixing to detect the presence of atypical blocking antibodies which may not produce agglutination after incubation because of the zoning phenomenon. If the sedimented cells show no agglutination, incubation and recentrifugation are then carried out.

Multiple transfusions of red cell concentrate have proved to be of great value in preparing patients with acquired hemolytic anemia for splenectomy. In several cases the anemic state was temporarily eliminated in 24 to 36 hours by multiple transfusions. On the other hand, it should be kept in mind that transfusions have a very transitory effect because of the accelerated destruction of all red cells in the patient's circulation and that transfusions are not a substitute for splenectomy which as yet offers the only hope of a real remission in the majority of patients.

HEMOLYTIC DISEASE OF THE NEWBORN

A detailed discussion of hemolytic disease of the newborn is beyond the scope of this report, since it presents a special problem in the field. The infant is exposed to a hemolytic antibody of maternal origin *in utero* and the chief problem in therapy is the hemolytic anemia which continues after the removal of the infant from the source of antibody. Continued destruction of red cells for days or weeks following birth indicates that the antibody present is probably not neutralized or destroyed completely by hemolysis of the sensitized cells. It is possible that hemolysis may release the antibody to damage more erythrocytes and perhaps other tissues as well.

Recent advances in laboratory technique have made it possible to predict the occurrence of hemolytic disease prior to birth so that the necessary diagnostic and therapeutic measures can be arranged in advance of delivery. Experience to date with the replacement transfusion technique has been encouraging and so far parallels that reported by

Diamond.[9] The replacement transfusion provides the advantage of removing most of the destructive antibodies at the same time that the anemia is treated. In our experience only one replacement transfusion procedure has been needed in the treatment of severely anemic babies, whereas six to twelve separate procedures were required with the multiple small transfusion technique.

PAROXYSMAL (COLD) HEMOGLOBINURIA

The auto-antibody responsible for the hemolysis in paroxysmal (cold) hemoglobinuria requires a temperature below the average body range before it unites with erythrocytes. Therefore, although it can be demonstrated in the patient's serum between paroxysms of hemolysis, the titer tends to deminish or disappear following an attack. These well-known observations provide contrast with the findings in acquired hemolytic anemia where the immune body unites with erythrocytes at body temperature and the greatest part of the antibody is found on the surface of the erythrocyte at all times.

Paroxysmal hemoglobinuria should be suspected whenever the evidence of hemolysis, particularly hemoglobinuria, accompanies or follows chilling. The classical Donnath-Landsteiner technique of demonstrating the antibody in the patient's serum is too well-known to need description here.

HEMOLYTIC ANEMIAS ASSOCIATED WITH EXTRINSIC FACTOR

It is not the purpose of this report to discuss hemolytic phenomena produced by extrinsic agents. The cause of hemolytic anemias associated with parasitic infections and lytic substances that destroy the red cell is obvious and requires no further comment here. The mechanism of hemolysis in anemias which appear to be due to hypersensitivity is obscure, and further study with the transfusion and immunological techniques previously described is needed. The subject of the so-called symptomatic hemolytic anemias has recently been reviewed by Stats and co-workers;[26] but the underlying mechanism of hemolysis, whether cell defect, hemolysin or excessive stasis in the spleen and phagocytosis, has not been defined. We have studied one patient with hemolytic anemia associated with lymphatic leukemia who showed the usual evidence of hemolysin of an immune-body type and the rapid destruction of transfused cells. Whether or not an immune body will be a constant finding in this group of patients remains to be seen.

If treatment of symptomatic hemolytic anemia is required, therapy directed at the underlying disease should be attempted first. If the hemolytic process threatens the patient's life, splenectomy, if feasible, may produce relief. In connection with the association of hemolytic disease and malignancy, it is worth remembering that ovarian tumor has been found in the background in patients with hemolytic anemia and that the hemolytic process has subsided following removal of the tumor.

DISCUSSION

Although some light has been thrown on the subject of hemolytic anemias, it is obvious that many new problems have been created and many old questions remain to be answered. The classification presented is certainly tentative and is not complete even at this time. For instance, Haden[16] has recently described members of two families with familial hemolytic anemia without spherocytosis, which represents a new entity. On the other hand, Young and Lawrence[29] and Evans[15] have described single patients with hemolytic anemias that did not appear to be congenital or familial and could therefore be referred to as "acquired," in which hemolytic antibodies were evidently absent, since transfused cells were not involved in the hemolytic process. The defect therefore appeared to be in the red cell, yet the patients did not fit into any of the known categories of hemolytic anemia due to cell defect.

The structural defect which allows for spherocytosis, sickling, and susceptibility to acid hemolysis is as yet buried in the unknown regions of the physicochemical anatomy of the red cell. Watson[28] has recently reported extensive studies of sicklemia in the newborn of mothers with sicklemia, which show a low percentage of cells susceptible to sickling at birth as compared to four months after birth when the fetal red cells have been replaced by extra-uterine cells. The gradual increase in susceptibility to sickling during the first four months parallels the replacement of fetal hemoglobin by that formed following birth. Since qualitative differences such as resistance to alkaline denaturation have been demonstrated to exist between fetal and extra-uterine hemoglobin, the correlation with susceptibility to sickling is highly significant.

The demonstration of auto-antibodies in the great majority of patients with acquired hemolytic anemia provides considerable material for speculation. The antibody is really a tissue antibody since erythrocytes from other individuals are apparently destroyed as rapidly *in vivo* as the native cells. The concept of auto-antibodies is not new but the existence of this aberrant immunological activity has not been so clearly and consistently demonstrated in other diseases suspected of being due to similar cause. The acquired hemolytic anemias provide an excellent opportunity for observing the course of disease due to auto-antibodies, the effect of splenectomy, and other possible therapeutic measures. Observations made in this disease have a broad application in the field of medicine, particularly in those disease states of unknown cause, such as glomerulonephritis, rheumatic fever, rheumatoid arthritis, and other syndromes grouped under the general heading of the hypersensitive states.

The occurrence of idiopathic thrombocytopenia and hemolytic anemia of the acquired type in the same individual suggests that both diseases are due to the same process. Thrombocytopenia and leukopenia have been observed in almost 50 per cent of the cases of acquired hemolytic anemia observed by the authors. Some of the patients described by Doan and Wright[11] under the heading of primary splenic panhematopenia have shown evidence of a hemolytic process. It seems unlikely that the hemolytic anemia in such cases is due to an erythrocyte antibody while the thrombocytopenia and leukopenia are due to suppression of marrow production by some hypothetical hormonal agent or to excessive phagocytosis in the spleen or reticuloendothelial tissue. The role of auto-antibodies in thrombocytopenia needs reinvestigation with improved immunological technique.

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* * *

Median Nerve Injuries in Fractures in the Region of the Wrist

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SUMMARY

Injuries of the median nerve in fractures in the region of the wrist are not uncommon.

Median nerve palsy is frequently the result of immobilizing the wrist in acute palmar flexion.

Good reduction and immobilization of the wrist in neutral position are the best means of preventing median nerve injury.

In any fracture in the region of the wrist, the status of the median, ulnar, and radial nerves should be examined before and after reduction of the fracture.

The majority of patients with median nerve neuritis recover completely without operation. In some cases, the duration of the sympathetic nerve paralysis is unpredictable.

Where neurological symptoms persist, neurolysis with or without sectioning of the transverse carpal ligament will improve the neurological status of the patient.

ALTHOUGH median nerve injuries are not infrequent complications in fractures of the wrist, standard texts on fractures either do not mention injuries of this kind or consider them to be extremely rare. For example, Key and Conwell[3] in discussing complications of fractures of the distal third of the radius, state that "very rarely with marked displacement the median nerve may be injured by the lower end of the upper fragment." However, Abbott and Saunders[1] felt that this complication is not so rare and should warrant more than a passing reference in a discussion of fractures of the wrist.

Since the first report of a case by Gensoul in 1836, 40 cases have been reported in medical literature. Within the last year and a half in private practice, the author has observed four patients with median nerve injuries and one with ulnar nerve neuritis in association with fractures in the region of the wrist.

REVIEW OF LITERATURE

In 1836, Gensoul reported the case of a young girl who died of tetanus following fracture of a forearm. At autopsy the median nerve was found to be caught between the ends of the fractured radius. Paget in 1854 cited a case in which the median nerve was involved in the excessive formation of callus around a fracture of the lower end of the radius. De Rouville in 1905 described a pseudoneuroma, three times normal size, of the nerve in the case of a 53-year-old man who developed a late median nerve paralysis following fracture of the radius. Blecher in 1908 collected reports of nine cases from the French literature and added one of his own. Kirchheim in 1910 collected reports of four more cases from the German literature. A basic review of the subject was made by Abbott and Saunders in 1933.[1] They presented reports of eight new cases. In 1945 Zachary reported two cases of compression of the median nerve within the carpal tunnel associated with old bony derangements at the wrist.[5] Eight similar cases were reported by Cannon and Love in 1946.[2]

THE ANATOMY OF THE MEDIAN NERVE AT THE WRIST

Abbott and Saunders gave the following description of the regional anatomy involved in this discussion:

> The anatomical considerations of the median nerve at the wrist joint are of particular importance in explaining the special features and types of involvement which are met with when this nerve is injured in Colles' fractures. The nerve is not directly related to the volar surface of the radius but is separated from it by the fleshy mass of the pronator quadratus muscle and by the tendon of the flexor pollicis longus muscle. The pronator quadratus muscle serves to protect the nerve from fragments of this bone. At the wrist joint the nerve becomes superficial and lies on the ulnar side of the tendon of the flexor carpi radialis; behind or on the radial side of the palmaris longus. Just before passing into the hand, deep to the transverse carpal ligament, it often assumes such a superficial position as to be readily palpable. At this point the nerve gives off its palmar cutaneous branch which supplies the proximal part of the palm of the hand with sensation. Passing deep to the transverse carpal ligament and over-lapped by the lateral part of the synovial flexor sheath, it enters the palm and divides into medial and lateral divisions. Through the medium of these two divisions the nerve supplies the muscles of the thenar eminence, two or more lumbricals, and the lateral three and one-half fingers with sensation on their palmar aspect, and on their more distal part of the dorsal aspect. This area of sensory supply is subject to considerable individual variation, for the median nerve anastomoses to a variable extent with the ulnar and sometimes radial nerves, connections which may explain the variability in both motor and sensory findings.
>
> It is of the greatest importance to remember that the median nerve carries with it most of the sympathetic nerve supply of the hand, an anatomical fact associated with frequency of trophic disturbances found when this nerve is injured.[1]

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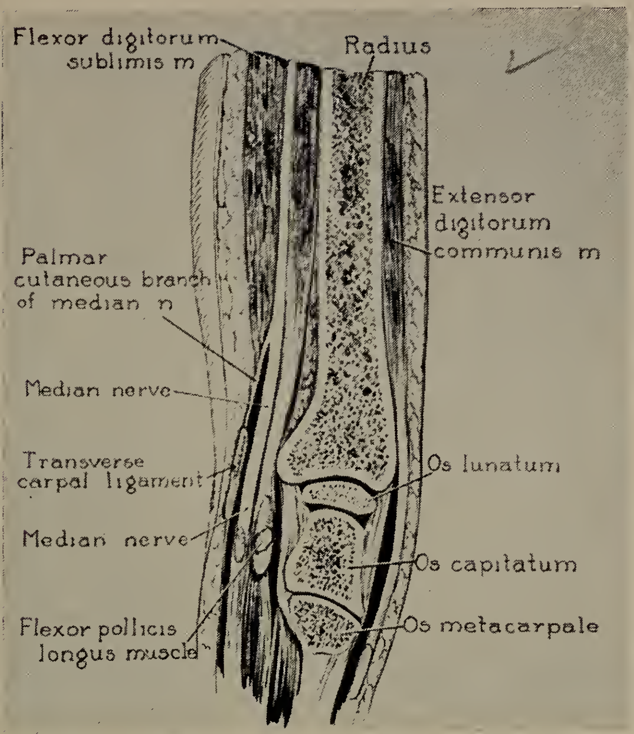
Flexor digitorum sublimis m
Radius
Extensor digitorum communis m
Palmar cutaneous branch of median n
Median nerve
Transverse carpal ligament
Median nerve
Os lunatum
Os capitatum
Flexor pollicis longus muscle
Os metacarpale

Figure 1.—Sagittal section to illustrate the relation of the median nerve in the region of the wrist. Note the close relationship which the transverse carpal ligament and the prominent lower anterior border of the radius bear to the median nerve. (Used by permission of *Surgery, Gynecology and Obstetrics.*)

CLASSIFICATION OF THE MEDIAN NERVE INJURIES IN FRACTURES IN THE REGION OF THE WRIST

In the same review these observers classified median nerve injuries as follows (I) Primary injuries. (II) Secondary injuries. (III) Late or delayed involvement. (IV) Injuries associated with treatment: (a) acute palmar flexion; (b) reduction. The author suggests that the fourth category be enlarged to include median nerve paralysis associated with treatment and reduction of the fracture.

PRIMARY INJURIES TO THE MEDIAN NERVE

An injury to the median nerve occurring at the moment of fracture is classified as a primary injury. Because of the protection afforded by the pronator quadratus muscle, the majority of injuries develop indirectly from the pressure of a grossly displaced fragment.

The injuries most likely to fall into this group are those associated with carpal fractures and dislocations. Injury of that type is illustrated in the following case report:

Case 1.—The patient, a 26-year-old white male, was injured May 27, 1948, when the motorcycle on which he was riding was struck by an automobile. The essential findings were: severe comminution of the olecranon, anterior dislocation of the elbow, transcarpal dislocation with fracture of the navicular, and sensory paralysis of the median nerve. There was no motor paralysis. An open reduction and plating of the olecranon was done; the transcarpal dislocation was reduced, and a cast was applied.

On July 13, 1947, when the cast was removed, sensory loss and dryness of the skin were confined to the area of distribution of the median nerve of the hand.

On September 11, 1947, under local anesthesia, the median nerve was exposed. No adhesions were noted. On injecting the nerve with saline, a constriction was evident at the level of the transverse carpal ligament. The nerve was followed into the carpal tunnel without sectioning the transverse carpal ligament. The day following operation, sensation in the thumb was normal. Five weeks later, sensation was normal in the hand, but the skin was still dry. The dryness of the skin was still present at the time the patient was last examined, February 14, 1948.

SECONDARY INJURIES TO THE MEDIAN NERVE

Injuries to the median nerve occurring within two months following fracture are arbitrarily considered secondary median nerve injuries. Most injuries that fall into this category are characterized by gradual development of both subjective complaints and objective findings. In the majority of cases, neuritis develops from continued pressure on the nerve by an unreduced fragment or excessive formation of callus.

Abbott and Saunders[1] reviewed Hilton's report of a case in which the median nerve was compressed from the excessive callus in the lower end of the radius. They also reported the case of a 47-year-old man in which a fracture of the wrist was not reduced because of the patient's cardiac status. Four weeks after the injury, numbness developed in the thumb and index finger. These symptoms were relieved by neurolysis of the median nerve two months after the injury. Following is an additional report of a case of secondary median nerve injury:

CASE REPORT

Case 2.—A 39-year-old white female who was referred for consultation, in a fall had received a fracture through the distal third of the radius. A cast had been applied without manipulation. The wrist was immobilized in neutral position. Two weeks after the injury, numbness developed in the thumb, index, and middle fingers. There was no muscle weakness. Sensory hypesthesia corresponding to the distribution of the median nerve was noted. The patient recovered completely without treatment four months after the injury.

LATE OR DELAYED MEDIAN NERVE PARALYSIS

Late, delayed, or tardy median nerve paralysis refers to cases in which the paralysis occurs later than two months following injury. Such cases were reported by Paget in 1865, by De Rouville in 1905, by Lewis and Miller,[4] who in 1922 cited a case observed by Phemister, by Abbott and Saunders[1] in 1933, by Zachary[5] in 1945, and by Cannon and Love[2] in 1946. Onset of paralysis in those cases varied from three months to 18 years after injury.

None of the cases observed by the author falls into this group.

ACUTE PALMAR FLEXION

Abbott and Saunders called attention to the importance of the position of acute palmar flexion following the reduction of a fracture in the development of median nerve neuritis. Of particular interest was the observation that the neuritis seemed to develop consistently in cases in which osteotomy was done to correct malposition of the radius. In such cases the surgical trauma and the acute palmar flexion both tended to narrow the space between the radius and the transverse carpal ligament. Resultant pressure of the transverse carpal ligament on the median nerve was responsible for the clinical picture. It is scarcely necessary, therefore, to emphasize that in performing osteotomy for malposition in the distal third of the radius, the position following operation should be sufficiently stable to allow immobilization of the wrist in neutral position. The following case report will serve to illustrate:

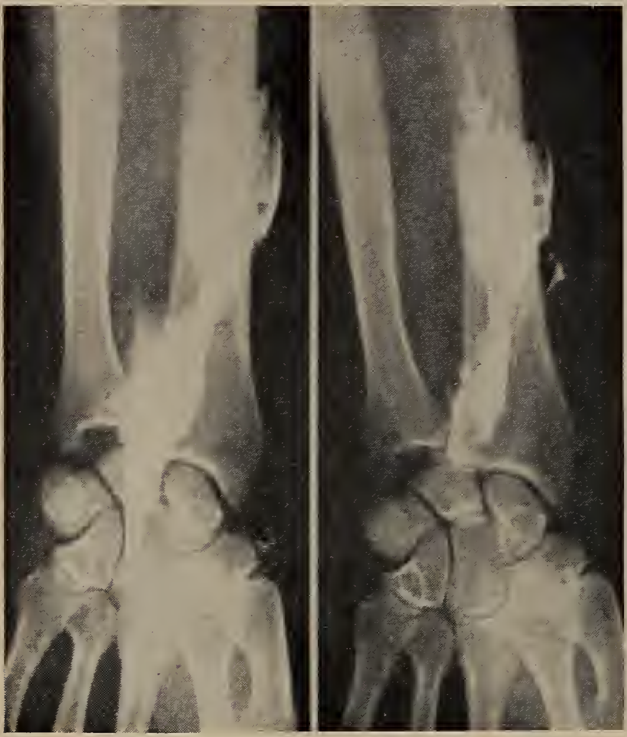

Figure 2.—Left, roentgenogram after injection of the sheath of the median nerve with lipiodol with the wrist held in extension. In this position the solution flowed freely into the palm of the hand. Right, roentgenogram after injection of the sheath of the median nerve with lipiodol with the wrist held in acute palmar flexion. The solution is arrested at the level of the transverse carpal ligament. (Used by permission of *Surgery, Gynecology and Obstetrics*).

CASE REPORT

Case 3.—A 48-year-old woman who was referred by an insurance company two and a half months after fracture of the left wrist, stated that the fracture had been reduced immediately after the injury and the wrist immobilized in acute flexion in a cast. There was at that time, the patient said, immediate severe swelling of the hand and numbness of the thumb, index, and middle fingers.

Upon examination, dryness of the skin on the volar aspect of the thumb, index and middle fingers was noted, with sensory hypesthesia corresponding to the same area. The fingers were stiff, and flexion brought them only to an inch from the palm.

Three months later, normal sensation had returned, and within ten months all evidence of median nerve paralysis had cleared except for dryness of the skin on the palmar aspect of the index finger.

INJURIES ASSOCIATED WITH TREATMENT

The following case illustrates paralysis of the median nerve following repeated attempts at reduction of the fracture:

CASE REPORT

Case 4.—A seven-year-old boy was referred a month after a fracture of both bones of the forearm had been reduced. Roentgenograms in the cast showed the wrist to be in slight palmar flexion and there was contact of the fractured ends of the radius through one-half of the shaft. In roentgenograms taken ten days later, complete displacement of the fracture was noted. The day before the patient was referred, the physician referring him had made repeated but unsuccessful attempts at reduction of the fracture.

Upon examination, prior to manipulation of the fracture, loss of opposition of the thumb was noted, together with weakness of flexion of the distal phalanx of the thumb and index finger, and sensory anesthesia corresponding to the distribution of the median nerve. The skin was dry in the same area. Satisfactory reduction of the fracture was obtained and the wrist was immobilized in neutral position. A month later sensation was normal and opposition of the thumb had returned, but the skin was still dry.

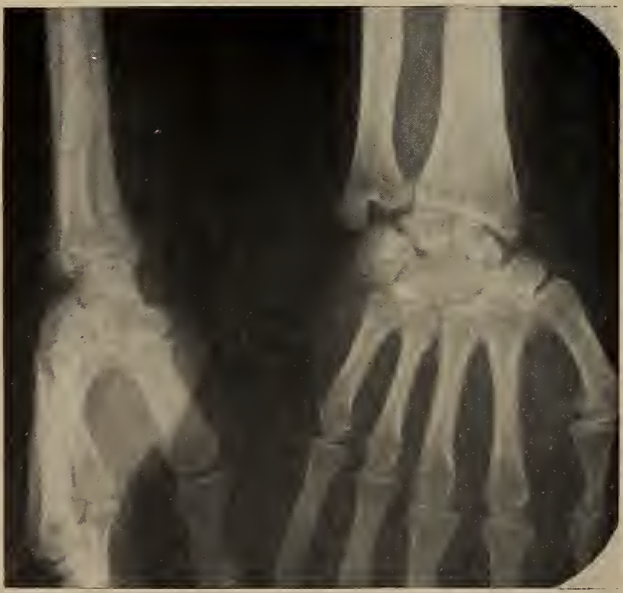

Figure 3.—Case 1. Transcarpal dislocation with an immediate median nerve injury.

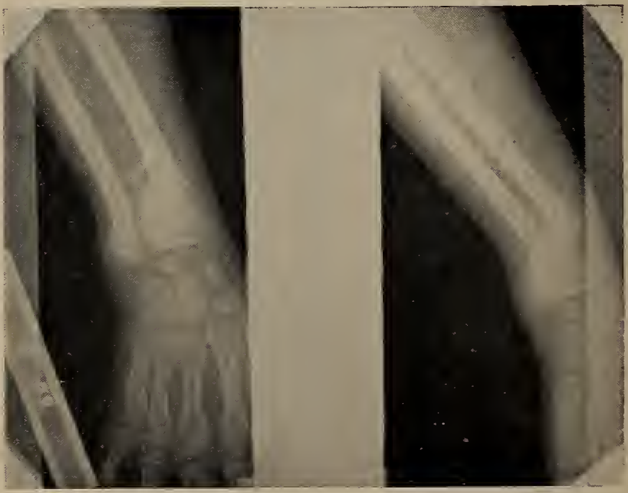

Figure 4.—Case 4. Median nerve injury developed during manipulation.

DISCUSSION

As poor functional return and prolonged disability are common after fractures in the distal third of the radius which are accompanied by severe swelling of the fingers, more attention should be given to numbness of the fingers which is frequently noted in connection with these symptoms, for this is probably the result of nerve compression. Anatomically, it has been demonstrated that the position of acute palmar flexion causes a narrowing of the space between the radius and the transverse carpal ligament. The presence of hematoma and the swelling accompanying both the fracture and the trauma caused by manipulation would further tend to narrow the space and thus increase the possibility of median nerve compression. This mechanism explains the majority of cases of primary median nerve injuries.

Except for the comment by Speed in discussing the paper by Lewis and Miller[4] in 1922, scant attention has been paid to median nerve injuries due to transcarpal dislocations of the wrist. Median nerve neuritis as a result of transcarpal dislocation was illustrated in Case 1. The median nerve can also be injured more directly during manipulation, especially in cases of fracture of both bones of the forearm in children. Reduction of such a fracture is most easily accomplished by hyperextension at the site of the fracture; but it should be noted that the median nerve can be stretched or contused during manipulation. The same mechanism could be responsible for injury to the median nerve in the treatment of Colles' fractures where the deformity is increased to break up an impaction, as is advocated in many textbooks. Case 4 demonstrates this type of injury to the median nerve.

The development of neuritis in both median and ulnar nerves many years after a fracture has healed in poor position is a complication which needs greater recognition. In the literature are reports of cases in which neuritis of this kind occurred from two months to 20 years after the injury.

DIFFERENTIAL DIAGNOSIS

The neurological literature contains frequent mention of thenar muscle atrophy, usually without accompanying sensory disturbance. No causative factor has been found. This has been labelled "thenar muscle paralysis" and it is differentiated from median nerve injuries in fractures mainly by the absence of bony changes in the wrist or forearm.

TREATMENT

Median nerve neuritis can best be prevented by good reduction of the fracture and immobilization of the wrist in neutral position. If symptoms of neuritis develop immediately after reduction, correction of the palmar flexed position is indicated at once. If symptoms persist after four months, surgical exploration of the median nerve is advisable.

Whatever the cause of the neuritis, neurolysis or neurolysis with sectioning of the transverse carpal ligament will arrest or cure the disability in the majority of cases. The improvement in neurological function following operation has varied with the degree of severity of the neurological status. The more complete the nerve palsy present, the less recovery occurs.

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Discussion by Lloyd D. Fisher, M.D., *Oakland*

Dr. Meadoff is to be commended for emphasizing the occurrence of median nerve damage in injuries about the wrist. By adding to the number of reported cases he indicates that such injuries are probably far more frequent than has generally been supposed. This complication is especially important because of the fact that loss of the power of opposition of the thumb is extremely disabling.

We might ask why this complication has been so frequently and commonly overlooked. Some of the reasons may be as follows:

1. The fracture of bone receives major attention and concern, and other injuries, unless quite obvious, are apt to be overlooked.
2. Failure to recognize that median nerve injury is a not infrequent complication of wrist injuries.
3. Difficulty in evaluating neurological changes in the presence of the symptoms and findings of acute fracture.
4. The very frequent variability in motor and sensory supply of the median nerve.

I am afraid that some of us, in our haste and in our concern over the bony injury, have forgotten one of the fundamental teachings of fracture treatment: That careful examination should be made for evidence of nerve and vascular damage in every fracture.

It is well to remember that the motor supply of the first two lumbricals comes by way of the terminal cutaneous branches of the median nerve. Also, it bears repeating that no matter what variations occur in the nerve supply, sensory changes in the index finger are a sure indication of median nerve damage. In secondary or delayed cases, sudomotor change in the skin is important confirmatory evidence.

Most important of all, I believe, is the emphasis on prevention of median nerve damage. To be sure, nothing can be done in a preventive way about primary nerve damage. We can, however, by proper treatment, avoid or minimize later damage.

In general, as Dr. Meadoff has pointed out, good reduction, proper immobilization, and, later, proper mobilization are all-important. Specifically such prevention should consist of:

1. Avoidance of hyperextension of the fracture during reduction.
2. Accurate reduction by restoring the dorsal, radial, and rotary displacement of the distal fragment, adding the least possible amount of trauma in so doing.

3. Avoiding immobilization in the hyperflexed position.
4. Maintenance of reduction by proper immobilization.

The immobilization in a neutral position advocated by Dr. Meadoff is ideal if one is able to maintain reduction in that position. Personally, however, I have not been able to consistently maintain reduction in the neutral position.

Some of the remarks of Sir Reginald Watson-Jones are very pertinent in this regard. In regard to sources of disability in Colles' fracture he says: "In a very few cases, the backward displacement stretches the nerve over the front of the wrist and transient median neuritis develops, with tingling and numbness of the fingers and weakness of the thenar muscles."

As to manipulative reduction, he states: "The fragments should not be disimpacted by increasing the backward displacement because this increases the injury to already bruised tissues over the front of the wrist. There is no difficulty in completely disimpacting the fracture by strong traction applied to the fingers and thumb. When this has been done, reduction of the displacement must be completed by direct pressure over the fragments."

Regarding immobilization after reduction he says, in part: "The carpus and lower fragment are pushed inward and forward. There is no need to flex the wrist strongly, and the Cotton-Loder position should be avoided."

Discussion by J. B. de C. M. Saunders, M.D., *San Francisco*

Dr. Meadoff has rightly emphasized that injuries to the median nerve in fractures in the region of the wrist are a not infrequent complication which is frequently overlooked. That injury to this nerve in greater or lesser degree is not uncommon is indicated by the fact that within the year following the initial publication by Dr. Abbott and myself we encountered no less than 19 additional cases. It is true that in the vast majority of these cases the nerve damage was incomplete and the symptoms very transient but in one or two the damage was of sufficient magnitude to demand neurolysis. In most instances, the loss was purely sensory and seldom was motor power affected.

We feel that in all cases of fracture of the lower end of the radius the surgeon should carry out a meticulous examination in order to determine the presence or absence of median nerve involvement before reduction is attempted. In this connection, it is most interesting to note Dr. Meadoff's observation that the median nerve may be traumatized by hyperextension at the time of reduction. I am sure that this is possible, but to be truthful, the mechanism had not occurred to me. We should also like to emphasize the point that excessive palmar flexion as a position of fixation is a frequent cause of injury to the nerve, for in this position it may be pinched between the bony prominences and the proximal edge of the transverse carpal ligament. If it is found necessary to use a position of exaggerated palmar flexion for fixation, frequent examinations of the sensory and motor supply of the thumb and index finger should be made in order to avoid possible injury to the nerve, which, as we have noted, may lead to a degree of permanent loss of the function of the hand.

I wholeheartedly agree with Dr. Meadoff that this is a far more frequent complication than the textbooks would lead one to believe.

* * *

Rheumatoid (Marie-Strumpell) Spondylitis

Technique of Examination and Importance of the Costal Joints

A. Justin Williams, M.D., *San Francisco*

SUMMARY

Rheumatoid spondylitis in the early prodromal stage may present a complex and obscure clinical picture making diagnosis difficult. It is in this early stage that roentgen examination of the small joints of the spine will often aid in or lead to the correct diagnosis of the disease in which the classical clinical symptoms and roentenographic findings in the sacroiliac fissure have not appeared and may never appear. The changes in these small joints, particularly in the costovertebral and costotransverse joints, are less obvious and require experienced and careful interpretation, but it is to these that the roentgenologist must direct his attention if he is to be of assistance in early diagnosis. A technical procedure for this examination is presented, along with a discussion of the clinical importance of changes at this site.

Demonstration of involvement of the sacroiliac joints is of diagnostic importance, but this finding is no more necessary to the diagnosis of rheumatoid spondylitis than is involvement of any other single joint of the spine. Insistence on sacroiliac involvement will often result in missed diagnosis, and has led in part to erroneous conclusions as to sex incidence of the disease.

RHEUMATOID spondylitis is a chronic progressive disease characterized by lesions of the small joints of the spine and ribs, and of the sacroiliacs, by youth at the onset,[14] and by a tendency to progress to spinal ankylosis. The cause is not known, but it presents many features common to infectious disease, and it is thought by some, probably correctly, to be unrelated to rheumatoid arthritis or arthritis deformans. It is one of the common diseases of mankind, and is to be suspected in those cases in which there are unexplained peripheral and visceral pains, elevated temperature and increased blood sedimentation rate, even though the late classical manifestations of back pain, limitation of motion of the spine and roentgenological evidence of the disease in the sacroiliac joints have not yet appeared.

Although many observers have reported that rheumatoid spondylitis is preponderantly a disease of males, in the author's experience it was found to affect about as many women as men. In a series of 151 patients with rheumatoid spondylitis who were treated by the author in 1946-47, 76 were males and 75 females; and of 97 untreated patients observed, 53 were males and 44 females. In all these cases, the disease was diagnosed by clinical and radiographic studies, and none by radiographic study alone. Possibly because of architectural differences and usually less vigorous physical activity, females are less prone to develop sacroiliac changes, and much less commonly reach the clinical "spondylitic" stage. This will account, in part at least, for the wide disparity in reports of sex incidence in which there is a variance of 13:1 male[17] to 1:1 reported herein.

Seven[15] stated in 1903 that the first change in rheumatoid spondylitis is a synovitis of the small posterior intervertebral or apophyseal joints, and that in those cases in which the lumbar spine was attacked, the sacroiliac joints might become involved. Simmonds[16] and Fraenkel[7] described changes in the apophyseal joints in 1904. Oppenheimer[12] observed that the most important spinal joints, the apophyseal, receive little or no attention from orthopedists, radiologists or rheumatologists. They are true diarthrodial joints, and differ almost as much from the sacroiliac joints as do the hip joints. Passing references concerning involvement of the costal joints have been made by a number of observers, but while changes at these sites are extremely important diagnostically and in the disabling effects of the disease, little effort has been made to show these joints by roentgen study.

The costotransverse and costovertebral joints can be well visualized only in an anterior-posterior projection, with the central ray directed 20 degrees cephalad and centered between the fifth and seventh thoracic vertebrae (Figure 1). In large-boned individuals a right and left 10 degree medial oblique cephalic projection may be necessary to outline the costovertebral joints. The conventional 90 degree anterior-posterior projection of the thoracic spine does not outline these joints well, and inaccuracies of interpretation may occur in any but advanced cases.

In a detailed study of over 500 cases of rheumatoid spondylitis in all stages, it was observed that in the great majority the earliest x-ray evidence of joint involvement was to be found in one or more of the costal or apophyseal joints. Rarely were the costal and apophyseal joints regarded as normal

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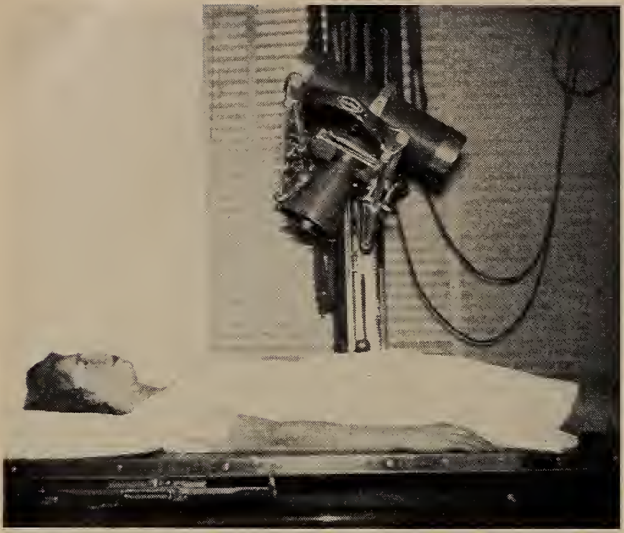

Figure 1.—Costal joints show best by an anterior-posterior 20° cephalad oblique, centered through the fifth to the seventh dorsal vertebrae.

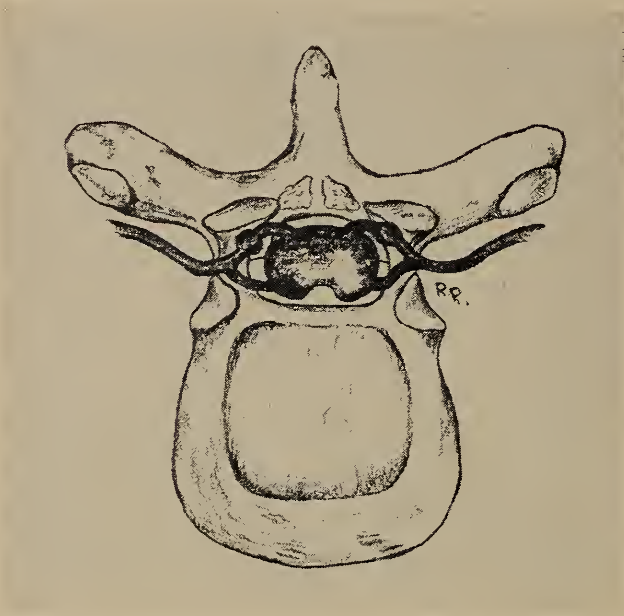

Figure 2.—Inferior surface, mid-dorsal vertebrae, showing apposition of the spinal nerve roots to the costal and apophyseal joints.

when the sacroiliac joints showed the changes considered characteristic, and regarded by most observers[2, 14, 9] as the earliest findings in rheumatoid spondylitis. Also, in many cases, particularly in females, advanced changes were found in these small joints when the sacroiliac joints appeared to be normal. This is logical if one is to assume that the most common of the prodromal symptoms in the "pre-spondylitic stage" of Scott[14]—pain, local or referred to the extremities, abdomen, or thorax—is caused by reflex or direct root irritation of the spinal nerve trunks, which are closely apposed to the involved joints (Figure 2). Oppenheimer,[13] in reporting on a total of 50 cases, in all of which characteristic apophyseal changes were noted, said that there was sacroiliac involvement in only 86 per cent of the total, and in only 60 per cent of those cases in which the apophyseal changes were in an early stage. Buckley,[4] Gordon,[8] Forestier[6] and others have reported cases in which the sacroiliac joints were not involved. Borak[3] concluded that the changes in the sacroiliac joints commonly associated with rheumatoid spondylitis are degenerative and are caused by increased torsional strain produced by stiffness of the lumbar spine, and are not the direct result of the disease.

Actually, the long fissure between the sacrum and ilium, commonly termed "sacroiliac joint," has two components: the true cartilaginous joint which occupies about the lower anterior third of the fissure, and the balance a fibrous synostosis without synovia. Since rheumatoid spondylitis originates as synovitis, it follows that the changes demonstrated by x-ray in the sacroiliac fissure are of two types: one, actual involvement limited to the true joint, and the other, seen equally often, a secondary degeneration of the fibrous ligaments joining the two bones. This latter finding is seen not uncommonly in one, and less often in both sacroiliac joints in long standing cases of spinal malalignment or fixation from any cause.

First, synovitis and exudation into the joint occur. In this stage, x-ray findings are usually absent. Next, an infiltration of small round cells develops, and an invasion of connective tissue starts. Here, the x-ray findings of clouding of the joints and loss of definition and irregularity of the articular surfaces, and sometimes periarticular or generalized osteoporosis, appear. The latter is extremely difficult to determine unless well developed. The apophyseal and costal joints are probably never involved in the initial stages simultaneously; rather, the process begins in one or more joints, and may remain localized, or others may be involved successively, so that it is usually possible, in all but very early or late cases, to see many stages of the disease in an individual case (Figures 3, 4).

These changes may occur without the appearance of the clear-cut local manifestations of pain, tenderness and limitation of motion considered by many to be characteristic of the disease. (A rapid sedimentation rate is present during exacerbation in between 80[1] and 90[10] per cent of cases, and a high spinal fluid protein content—45 to 121 mg. per cc.—may be found.) It is in these early stages, because the symptoms may be so variable in both location and severity, that the clinical diagnosis is difficult; and patients have been diagnosed as having subdeltoid bursitis, hip joint disease, pleurisy, sciatica, renal colic, intercostal neuritis, "acute surgical abdomen" (in severe acute cases), and herniated disc.[5] To these erroneous diagnoses are added, from the author's experience, coronary artery disease, psychogenic backache, psychoneurosis, rheumatic fever, acute pancreatitis, gall bladder disease, and appendicitis and herpes zoster.

Rarely, tuberculosis, coccidiomycosis, brucellosis and pyogenic infections may produce similar changes. The lumbar apophyseal joints show a similar appearance secondary to disc degeneration, one segment above and at the disc level, in about 20 per cent of cases. Hypertrophic osteoarthritis commonly involves these joints; in this disease the joint space appears to be narrowed but remains clear, the articular surfaces are smooth, and there is marginal spurring and dense sclerosis of the articular surfaces (Figure 5). Frequently, in the third decade of life and after, a combination of the two types is seen.

In the later stage the findings become more definite. Articular surfaces become eroded and serrated, cartilage is replaced by connective tissue, the joint space becomes dense and is finally obliterated by bony proliferation, subarticular sclerosis develops, and fibrocystic degeneration may be seen around the joints, and they become completely ankylosed.

In the final stage of rheumatoid spondylitis, which is seen proportionately rarely, the "bamboo" spine caused by calcification in the longitudinal ligaments and annulus of the disc[11] appears. At this time, the patient is stooped, with all spinal and rib cage movements frozen—the typical spondylitic wreck (described by Scott[14]) who might have been salvaged if proper diagnosis had been reached early and treatment begun immediately.

The author is in accord with Comroe's[5] dictum that "it is good medical practice to always perform a sedimentation rate and x-ray the low back and sacroiliac joints when a patient complains of vague aches and pains in the back or extremities," but to it would add: x-ray the costal and lumbar apophyseal joints when a patient complains of unexplained abdominal or thoracic pains and/or vague aches and pains in the back or extremities.

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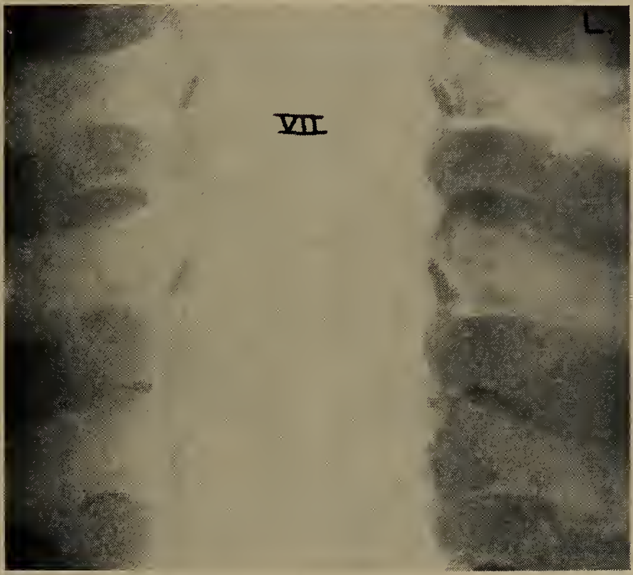

Figure 3.—(M.N.): Female, age 32. Vague chest and precordial pains intermittently ten years. Bilateral narrowing, haziness and loss of joint definition, 7th and 8th, slight haziness 10th left, normal 10th right, costotransverse joints. Narrow and hazy 9th costovertebral. Others, normal. Sacroiliacs normal.

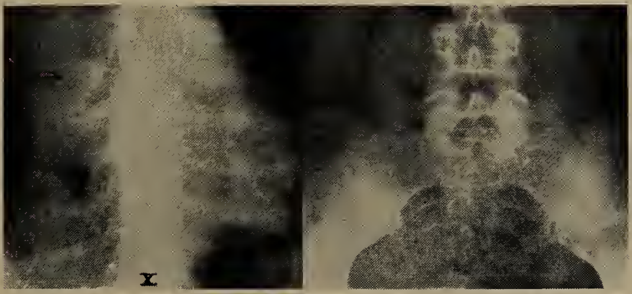

Figure 4.—(F.H.): Female, age 42. Vague intermittent pains until injury one year ago, followed by onset of severe back pains, and stiffness. Varying degrees of involvement of the costotransverse joints, with complete ankylosis of that of the fifth, right. Minimal changes right sacroiliac joint. Completely relieved of symptoms following two series of treatments.

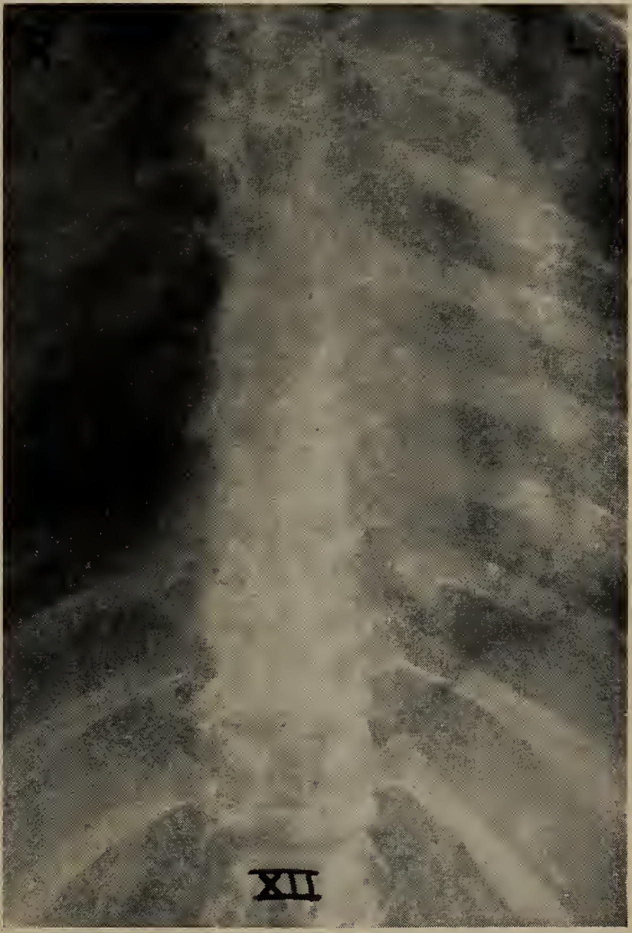

Figure 5.—(M.A.): Female, age 38. Bilateral radiating chest and upper abdominal pains intermittently for years. Hypertrophic osteoarthritis (degenerative) of the ninth left and tenth bilateral costotransverse joints. Joint spaces clear. Sub-articular sclerosis and spur formation. Normal clear costotransverse and costovertebral joints of the ribs above 9 and 10.

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Discussion by Edward W. Boland, M.D., *Los Angeles*

Dr. Williams is among the first to report detailed roentgenographic studies of the costovertebral joints in rheumatoid spondylitis. Heretofore most attention has been directed toward those changes which occur in the sacroiliac and apophyseal joints, and in the paravertebral ligaments. Yet the costovertebral joints are deserving of consideration because involvement of them leads to some of the most distressing clinical manifestations of the disease, namely, chest pain particularly on inspiration, possibly so-called girdle pains, fixation of the thoracic cage in an expiratory position with flattening of the anterior chest wall, diminished pulmonary excursion with reduction of vital capacity and exertional dyspnea.

Dr. Williams' statistics on sex incidence are at variance with those published by others. Almost all investigators have agreed that rheumatoid spondylitis has a predilection for males, the sex ratio varying in different series from 6:1 to 20:1. In my own private practice the ratio has been approximately 4 males to 1 female. The disparity between Dr. Williams' statistics and those of others may be explained perhaps by differences in criteria for diagnosis.

At the Army Rheumatism Center, Army & Navy General Hospital, I had opportunity to study a large number of soldiers with this disease. In one period of two years, for example, 1,084 patients with rheumatoid spondylitis were admitted. These comprised 18.1 per cent of 6,000 consecutive admissions for rheumatic disease during that period. Some of my observations and conclusions differed from those presented here by Dr. Williams.

In the vast majority of those patients (80 per cent) the first symptoms began in the lower back. These usually consisted of aching and stiffness, at first recurrent but later persistent. Sometimes sharp pains or "catches" in the buttocks, hips or lower back constituted the first complaints. Intermittent sciatic pain, often alternating from side to side, was present in about 10 per cent of early cases. Much less frequently (20 per cent) were the first symptoms located at higher levels (lumbar, thoracic or cervical segments).

Dr. Williams has stated that females are less prone to develop sacroiliac involvement and that in them the early pathologic changes more often begin higher in the spine, in the costovertebral and apophyseal joints. In my experience, the majority of women have the first clinical manifestations in the lower back, although the percentage may be somewhat lower than in men. A word of caution should be inserted here: An unequivocal diagnosis of rheumatoid spondylitis, even in females, should be made with hesitation unless characteristic alterations are present roentgenographically in the sacroiliac and/or apophyseal joints. X-ray evidence of bilateral sacroiliitis is almost pathognomonic of rheumatoid spondylitis. But when the sacroiliac joints are roentgenographically negative, clinical criteria should be at hand before the diagnosis of spondylitis is definitely made. These criteria include characteristic symptoms and physical findings, elevated erythrocyte sedimentation rate, or perhaps coexisting rheumatoid arthritis in peripheral joints.

In experience among soldiers, the earliest roentgenographic alteration were almost invariably located in the sacroiliac joints; certainly the sacroiliac changes were the most diagnostically reliable. Shebesta and I made a special study attempting to correlate the clinical and roentgenographic changes in 50 cases. Detailed clinical appraisal and exhaustive roentgenographic studies of the spinal joints were accomplished. Even when there were clinical signs of lumbar and thoracic involvement in early cases the apophyseal joints more often appeared normal, or at most questionable. Almost always the sacroiliac findings were more definite and of more diagnostic value. In some cases of longer standing, paravertebral ligament calcification was present before diagnostic changes in the apophyseal joints had occurred. We concluded that alterations in these articulations were quite inconstant and often late in appearing. For practical diagnostic purposes changes in the sacroiliac joints were found much more reliable in early cases. We made no special study of the costovertebral joints.

Moreover, we believed that the severity of the spondylitis, as appraised clinically, was often reflected by the character of the sacroiliac changes. In mild cases, juxta-articular sclerosis and narrowing of the joint were the predominant features; subchondral rarefaction was minimal and joint mottling was not prominent. In moderate cases, observed before ankylosis, subchondral rarefaction and sclerosis were present in fairly equal proportions, and mottling of the joint was definite. In severe cases, juxta-articular rarefaction and joint destruction were extreme; subchondral sclerosis was not so conspicuous.

As Dr. Williams has suggested, roentgenographically demonstrable alterations in the joints of the spine result from destruction of articular cartilage and from alterations in juxta-articular bone. When the pathologic process is restricted to the synovial membranes, roentgenograms are negative (swelling resulting from synovial effusion into the spinal joints cannot be visualized roentgenographically). As in peripheral rheumatoid arthritis, it may take months or years to develop sufficient cartilaginous or osseous alteration to be recorded on roentgenograms; the pathologic changes in some joints may never progress sufficiently to show positive x-ray findings. Therefore there is almost always a time lag between the development of localizing physical signs and the appearance of roentgenographic abnormalities. For example, x-ray changes in the sacroiliac joints may not appear for months or even years after the onset of back symptoms. Similarly, the patient may complain of pain, aching and stiffness and demonstrate local tenderness, muscle spasm and limitation of motion in the lumbar, dorsal or cervical regions for months or even years before the apophyseal joints show roentgenographic abnormalities.

The degree of extension may be much more accurately appraised by clinical than by roentgenographic criteria. Involvement clinically is often one or two segments higher than is evident roentgenographically.

This fact is important when the prescription for roentgen therapy is written. Obviously the selection of segments for treatment should depend mostly on the extent of clinical involvement if all actively diseased areas of the spine are to be treated.

Dr. Williams (closing): Dr. Boland, by his careful and very extensive investigation of a large series of cases and his many publications on the subject, has added much to the knowledge of this disabling disease. While at variance on some of the aspects of the x-ray findings, I am sure that we can agree wholeheartedly on one point, and that is the value of early diagnosis. This is extremely important to the patient for two reasons. First, that he can be given advantage of every type of treatment available, of which x-ray is probably the most effective. Secondly, he can avoid the expense and disappointment of missed diagnosis and misdirected treatment. I have listed the errors of diagnosis given by Comroe and in those cases that I have seen. Of all these, psychoneurosis is the most difficult for the patient to accept. It requires more painstaking and experienced study of roentgenograms of the small joints of the spine and ribs than of the sacroiliacs, but the results obtained more than justify the effort, for it is here that early evidence of the disease is found, and usually long before the sacroiliac joints present discernible changes.

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Problems of General Practice in Rural California

Hollis L. Carey, M.D., *Gridley*, and Carroll B. Andrews, M.D.,* *Sonoma*

SUMMARY

Medical care for rural populations is an important problem facing the medical profession nationally and locally. The mechanism for solution lies in the existing American Medical Association and California Medical Association committees on rural medical service and further development of "local health councils."

Additional emphasis on training of physicians for general practice is essential through medical school graduate and postgraduate periods.

The problem of providing additional adequately equipped and staffed hospitals must receive much consideration.

Recognizing that passiveness invites aggressive non-medical agencies to foster bureaucratic dictation inimical to the practice of medicine, the rural physician must act through medical and community organizations to correct weaknesses in the structure of medical practice.

INCREASING discussion by the lay press and rural organizations has focused critical attention upon medical care now being given the farm communities as units and as a whole. In response, the American Medical Association's Commission on Medical Service created the Committee on Rural Medical Service. Annual conferences sponsored by this committee have been held in Chicago since 1946. The purpose was to bring the various affected groups together with the American Medical Association committee for discussion of mutual problems. Individual state rural medical service committees have been established to work in conjunction with the parent American Medical Association committee on state and local levels.

In accordance with this plan, the first California Rural Health Conference was held in Sacramento, December 6, 1947. This conference brought together representatives of the California Medical Association, the State Legislature, the State Grange, the California Farm Bureau Federation, the Rural Health Association, the Wool Growers' Association, the dairy industry, the taxpayers' association, the Bureau of Agricultural Education, the Agricultural Council of California, the Public Health League, the Parent-Teachers Association, the clergy, the state nurses' association, the two dental associations in the state, the California State Department of Public Health, and laymen and physicians from the rural areas of the state.

The addresses and discussions were developed to bring out "the practical aspects of rural medical care." The remarkable point of the conference was the agreement of the majority of speakers that the solution of the various phases of the problem should be worked out by the communities themselves. The main request of the lay groups is for intelligent cooperative leadership and information. They look to their doctors for this aid. Unfortunately, the rural physicians themselves have insufficient information and their time is so limited that they have difficulty in taking upon themselves this added burden singlehandedly in each community.

A solution of the numerous problems probably lies in the organization of voluntary "local health councils." These local health councils, according to the American Medical Association plan,[6] are used instrumentally in furthering the spread of prepayment medical care plans. They may be expanded to meet any of the medical needs of the community, as they were developed in Alabama, North Carolina, West Virginia, Vermont and Virginia,[5] and are now being organized in Colorado,[4] and the country as a whole. They comprise representatives from all interested local groups. The activities and responsibilities are divided between committees as necessary. Development and guidance of such groups, if not the actual direction, is the immediate responsibility of the local physicians and the California Medical Association Committee on Rural Medical Service.

The most important problems confronting rural practice are: Increasing the number of younger adequately trained physicians; construction and maintenance of adequate hospital facilities with properly trained and supervised nurses, laboratory technicians, and other personnel; the continued improvement of office equipment, methods and assisting staff; prepayment medical and hospital service plan extension, evaluation and assistance at the local level.

The practicing physician's personal problems in office diagnosis and care of patients are urgent. More adequate, easily available clinical laboratories together with modern, efficient x-ray services are needed. Increased activity in the field of preventive medicine must be stressed.

It is clear that no one group, committee, society or, last—and least desirable—legislation, will solve these problems. Recognition of the various entities,

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*Chairman Committee on Rural Medical Service Conference.

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analysis of the factors involved and utilization of all available agencies of organized medicine together with the assistance of interested community and state-wide organizations will serve both to advance the purposes and provide a common ground for fruitful effort.

TRAINING FOR GENERAL PRACTICE

The curricula of the medical schools are organized to cover the field of medical arts and sciences in four years. The basic or preclinical sciences and clinical sciences are increasingly emphasized to keep pace with the rapid advances in research. This tends to diminish the time available in the medical school and hospital graduate training period for consideration of the more philosophical aspects and the practical elements of the art and practice of medicine. The increased period of training and the financial burden have imposed economic and sociologic problems upon the young medical graduate sufficient to warrant immediate serious objective consideration.

Evaluation of the graduate and undergraduate training methods should take into consideration the problems of those members of the profession who have stretched or cut their academic ties but upon whose shoulders the major burden of practice rests. The judgment and opinions concerning these questions by this portion of the profession are not only worthy of consideration but necessary for the proper integration and development of medical educational principles and policies. Individually these physicians are mainly inarticulate. As members of medical organizations in their own communities, and in the state and the nation, they may exert their energy and ideas to effective measures.

Medical schools are not unaware of the problem of adequate training for physicians electing to engage in general practice, but it is only recently that a few have adapted a portion of their undergraduate and graduate programs specifically to the purpose of training relatively well grounded physicians for general practice. The University of Wisconsin Medical School preceptor plan, originated in 1927, has continued in operation. Each senior student spends three months with a preceptor located in a smaller center outside the medical school sphere. Here, guided and taught by an experienced member of the profession, he is exposed to the practical problems of actual diagnosis, care and treatment of individuals in their own environment. The fact that this program of practical undergraduate training has continued to function effectively for the past 21 years is high commendation of the medical profession, the individual preceptors and the University of Wisconsin Medical School for their cooperative understanding and energy in perpetuating the program of insuring adequately trained young men for the areas requiring them.

A number of the middle western medical schools are instituting two-year general internships with an optional third year residency to meet the demand for properly trained physicians for the rural areas. The University of Minnesota Medical School is in its second year of experience in this field, and the University of Michigan Medical School has a similar plan. Two years ago the University of Colorado instituted a broad program of undergraduate and graduate training for general practice which has changed the complexion of the graduating classes remarkably.[2] Prior to the change 90 per cent of the graduates were electing to enter specialties. Approximately 75 per cent of the 1947 class elected to enter general practice. Other measures are being developed to increase the number and quality of physicians for rural and general practice. The University of Illinois Medical School currently is to limit the enrollment of candidates from the metropolitan population to 50 per cent of the total enrollment, thus providing that one-half of the students come from rural areas and the smaller cities. Scholarship funds for students electing to practice in rural areas have been established by the Medical Society of the State of Illinois. Other states in the Middle West have established scholarship funds and loan funds for the same purposes.

Postgraduate education has been given a marked impetus since the war. Primarily the medical school and teaching hospital programs were designed for the returning veteran. The number of veterans interested in intramural postgraduate work is now diminishing. Many of the departments are now engaged in redesigning their courses to the needs of the men who have been and are in actual practice. There is a marked difference in the problems of the two types of physician. The veteran has an opportunity for a "breathing spell" and is partially subsidized for his period of study. This is not the case with the physician actively engaged in practice and well rooted. It may be necessary to devise special methods to provide adequate refresher courses and postgraduate training for these physicians.

HOSPITALIZATION FOR RURAL COMMUNITIES

Analysis of the financial provisions of the Hill-Burton Act, together with information in the preliminary hospital survey for California by the California State Department of Health Bureau of Hospitals,[3] indicates that the funds provided from both federal and state sources will cover only a small fraction of the cost of hospitals of the kind and size needed for rural communities. This, coupled with the obvious disadvantages of governmentally dominated and directed construction, emphasizes the importance of local initiative and direction in this field. Full financing within the community might well be a better and ultimately less expensive procedure.

Concomitant with the problem of providing hospitals is that of adequate nursing staffs. Training and abilities of nurses for rural hospitals must be general, with stress upon adaptability, initiative, and resourcefulness to adjust simplified measures and equipment to emergencies as they arise. In this regard the program of nurse training at the University of Minnesota hospital might be examined with profit. Some of the members of each class are assigned or may elect a three-month period of training in small general hospitals before graduation.

RELATED CONSIDERATIONS

The supply of x-ray and clinical laboratory technicians must be greatly augmented. Small hospitals must find technicians capable in both fields if they are to survive the burden of overhead and operate self-sufficiently. Individuals trained to competence in both fields are not now generally available, nor is the duality of duty looked upon with favor by licensing bureaus or hospital authorities.

Organization of the medical staff of each hospital, with frequent meetings to discuss problems arising in practice, will greatly enhance the value of the hospital to the community and to the physicians themselves. Regular staff meetings, journal clubs and the added incentive derived from associations in the hospital are a spur to continuation and postgraduate study, and even to research. Increased and continued emphasis of preventive medical practices must be stressed. Early correct diagnosis and treatment of the patient must be repeatedly emphasized. The general practitioner must recognize that the over-all programs of the national, state and local committees of organizations such as those dealing with heart disease, cancer and arthritis, rely ultimately upon him to carry on the work of case finding, segregation and treatment to the point where special services are required.

Much in the fields of medico-economics and public relations that is of importance to medicine as a profession is neglected by the rural practitioner. In the past these factors were unconsciously dealt with by the individual physician. Complexities now require coordination of effort to counteract the forces in opposition. Increased thought, study and enterprise by the individual physician through his community, county and state organizations are needed.

Plans should be developed for adequate custodial care of the patient to supplant the antiquated relief homes, poor farms and rest homes now in operation. The county-operated infirmaries might well be supplanted by institutions operated in conjunction with community or local hospital district units to permit the care of self-respecting elderly people as such, in spite of personal financial difficulties. The problem of increased medical care and expense incidental to advancing years and reduced income should be worked out by the physicians, the community, the families and other responsible agencies, and not left to the vagaries of political expediency. This is said in an effort at objective analysis looking toward a program to correct obvious weaknesses and defects in rural medical practice, for a passive attitude by medicine in such matters will encourage aggressive non-medical agencies to foster further bureaucratic developments which will serve to limit the effectiveness of medical practice.

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Discussion by J. FRANK DOUGHTY, M.D., *Tracy*

The problems of rural medical service have been well presented in this paper. Few doctors graduate from medical schools today, trained to be a "complete doctor" such as is required for rural practice. Eighty per cent of the illnesses can be competently cared for by the general practitioner, and at much less expense to the patient. There is little indication that our medical schools, necessarily staffed by specialists, are aware of their responsibility in this regard.

Hospital facilities in rural areas would attract physicians and make for better quality medical care. The Hill-Burton Act is encouraging hospital construction in rural areas. In California, our State Department of Public Health was ready with the hospital survey, conducted by its Division of Hospital Surveys, ably captained by Dr. Philip K. Gilman. As a result, California will have more hospital beds. Many communities are financing their own hospitals in whole or in part.

There is a great future for the well trained doctor who is interested in the individual and the family, to render medical service in the rural areas.

The "complete doctor" treats the individual as well as the disease, and great are the satisfactions of such service in rural America.

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The Place and Training of the General Practitioner

WARD DARLEY, M.D., *Denver*

SUMMARY

Training for the medical student whose goal is general practice should aim at equipping him to maintain the close personal relationship with the patient which is considered the ideal basis for the treatment and prevention of disease. Preparation for general practice should anticipate graduate experience on a par with that which is currently considered necessary for the various specialties. Internship should be such as to fit the general practitioner to the peculiarities of the kind of community in which he will practice. Ability to recognize his own limitations and situations in which special consultation or referral are indicated should be developed in the student.

The University of Colorado School of Medicine has adopted a course of training, from pre-medical education through internship, designed for the student who is to specialize in general practice.

REASONABLY effective medical care is dependent upon a proper balance between medical information and the ability to put this information into actual service. Today, with medical knowledge accumulating as never before and with powerful factors operating to alter the social and economic setting in which medical service must be rendered, the medical profession is faced at the same time with complex problems and tremendous responsibilities.

It is axiomatic that good medical care will parallel high standards of medical education. For this axiom to hold, however, the term "medical education" must be used to denote an active process that concerns the entire period of the physician's professional activity—not just his years of basic professional preparation. The rapid and complex changes now taking place in and around medicine and its practice should create a powerful challenge to all who are interested in medical education and its complicated relationship to medical care. For some time now the time has been at hand for a reevaluation of the aims of medical education and the development of a philosophy of education and of curricula that are consistent with these aims.

Since the end of the war, Colorado has been attempting to do just this. The term "Colorado" is used broadly because the effort represents activities not only of the School of Medicine but of the state government, the medical societies, the hospital association, voluntary health organizations and many other units and interests in the state-wide community. While some of the thinking has taken root from suggestions contained in the literature, particularly the Weiscotten report[3] and Allen's *Medical Education and the Changing Order*,[1] much of it has developed as the result of our own observation of our own faults and problems and as the result of our own estimates of our own resources and responsibilities.

Walter Bauer has said that it is too bad that all individuals with "M. D." after their names are not physicians. While the qualities that make for the true physician are, in all probability, inherent in the individual and hence the original selection of the student for medicine is of the first importance, we feel that, nevertheless, the educational processes should do everything possible to develop and stimulate the expression of those qualities and abilities that are essential. In developing curricula that attempt to do this, we feel that the tendency for medical care to become less personal than it used to be is constituting a definite handicap. Doctors now tend to concentrate in the larger towns and cities. Roads are good; automobiles are comfortable and fast; consequently, more and more the patient comes to the doctor instead of the doctor going to the patient. The average physician sees many more patients in a day than he used to. As a result the time per patient is reduced at the expense of the patient-physician relationship. Doctors are joining together in groups and clinics. Patients are hospitalized whenever possible, even for minor illnesses. Interns or junior men take patients' histories, frequently do the physical examinations, make most of the night calls and often substitute or alternate with the "chiefs" on daytime home and hospital calls. Nurses, technical personnel and machines and gadgets play an increasingly more prominent part in patient contacts. Thus, from the patient's standpoint, his contacts with the doctor—his doctor—are becoming more and more dilute and less and less personal. While insurance plans of one kind or another which provide for medical care may be filling a definite need, I cannot help feeling that this type of medical care adds to the depersonalization of medicine. I also feel that medical care provided through health services, such as are developing in industry, schools and governmental agencies, is an impersonal proposition. In fact, I feel that anything

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From the Office of the Dean, University of Colorado School of Medicine.

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that detracts from the direct mutual responsibility between doctor and patient, as is the case when a third party pays the bills, is detrimental to the patient-physician relationship.

The development of specialism is playing an important part in depersonalizing medical practice. I recognize that the tremendous acquisition of medical knowledge has made specialism inevitable and necessary. Specialism has been productive of much good and is here to stay. I submit, however, that most specialists are primarily oriented to pathology and to patients with unusual and complicated problems. Preventive medicine and the continued care of the patient are not characteristic of specialty practice. The approach is to a part of, rather than to the total, patient. Because most of the clinical teaching in our medical schools has been and is being done by specialists and because the average medical school hospital and clinic provides an impersonal type of medical care, the educational experience of the average medical student is such that too little emphasis is placed upon the patient as a total human being. As a rule, little happens to stimulate the student's interest in the maintenance of health and the prevention of disease. His orientation is basically to the diagnosis and treatment of disease entities. His interest in the prevention of chronicity and disability is lukewarm to say the least. His teachers, for the most part, are specialists; and the courses, clinics and clinical services are organized around the specialties. Many individuals and departments take part in the patient's total care. The patient does not necessarily see the same doctor or medical student twice in succession, and as far as the doctor or the medical student is concerned, there is very little continuity or patient responsibility.

To me, one of the main reasons for the progress and success of American medicine has been the principle of the personal and intimate nature of the patient-physician relationship. I feel that the depersonalization of medicine which is gradually taking place may prove to be a serious threat to American medicine's effectiveness. I cannot conceive of a satisfying type of well-balanced medical care developing out of a system that is not based upon the activities of a physician who is not only interested in filling the gap between the patient as a person and his occasional needs for a specialist, but who is qualified to do so as well. In other words, I feel that the general practitioner, or his equivalent, should play the dominant role in any program of comprehensive medicine. There are many who disagree. Most of those in disagreement point to the internist as the one who should be concerned chiefly with the very personal consistent type of care which most of our people need and desire. If this is to be so, the training of the internist will have to be much different from what it is today.

Be this as it may, we in Colorado think that there will always be a need for the general and very personal physician and that whether it be general practitioner or internist, his training must be such as to prepare him for a special job. The general practitioners are with us. They are the physicians who are closest to our people, and we feel that they are the ones to be developed so that they can maintain the key position in our scheme of medical care. We feel that our educational institutions should give consideration to the place which the general practitioner should play in our scheme of medical care and that his education and training should be provided for adequately.

In line with this reasoning, we feel that the basic training of all medical students up to and through the internship should be as if general practice were the only goal. Given an undergraduate and intern experience limited to the needs of general practice, we feel that an additional period of graduate or residency training is necessary if the general practitioner is to function as he should. This idea is well expressed by Jensen[2] in a recent paper.

A short discussion of what we feel is the developing field of the general practitioner may serve to clarify his educational needs. This doctor—a physician in the fullest sense of the word—should be interested in and qualified to function as a health counsellor and a health coordinator for a given individual from birth to death. Personal preventive medicine, as well as community health, should claim a great deal of his effort. Ability to function effectively in the prevention, early diagnosis and treatment of emotionally and personality determined illnesses should be of the first importance. General diagnostic ability predicates that he will recognize his limitations and know when specialist consultation or referral is indicated. The need for proficiency in the therapeutics of the common medical conditions should be apparent. His need for surgical ability other than diagnostic will depend upon the locale of his practice and his proximity to surgical consultants and facilities. This physician should take particular interest in the prevention of chronicity and disability and should be keen to guide his patients to an active program of rehabilitation whenever indicated. What I have been describing is Dr. Lester Evans' concept of "the continuing care of the ambulatory patient." The physician who succeeds in this area will be the one who is adequately trained for the job.

The foregoing outlines the background reasoning of our efforts to emphasize the training of men and women for general practice. As already intimated, our effort begins with the freshman year in medical school. Very briefly, the undergraduate curriculum is first concerned with presentation of medicine as human biology: the normal development, structure and function of the individual human being's physique and personality and his reactions and methods of adaptation to the environment in which he has to live. An attempt is made to stimulate a reasonable interest in medical sociology and in personal and community preventive medicine. The student is brought into frequent contact with patients as total human beings throughout the freshman and sophomore years. The transition from medicine as human biology to human biology as medicine begins in the sophomore year, so that the last two years of the undergraduate experience can emphasize a general type of clinical training. During this period the student is given the opportunity to accept a prolonged period of supervised patient responsibility that is carried into the home, as well as through the out-patient clinic and hospital. Detailed specialty procedures and techniques are not emphasized.

In my opinion, the average internship as an educational experience is far from satisfactory. Space does not permit a detailed discussion of criticisms, but I will mention the three that are in line with this paper: (1) The intern does not take an active enough part in the day-to-day care of patients, (2) his experience has little to do with the care of ambulatory patients, and (3) he sees too much emphasis placed upon specialty techniques and procedures. I feel that too many hospitals utilize interns as "cheap help" to the total disregard of the intern and the theoretical reasons for the internship. The aims of the internship should be reviewed by a responsible body, all internships should be reevaluated and all hospitals that cannot qualify in the light of this reevaluation should discontinue their intern programs. The internship at the Colorado General and Denver General hospitals has been reorganized with the idea of obviating the above criticisms.

I have mentioned before that the basic training of all medical students up to and through the internship should be as if general practice were the only goal. I feel the time is at hand when we must realize that the four years of medical school and an additional year of internship will no longer qualify a physician to assume responsibility for a reasonably safe and effective independent professional activity. This preliminary training, therefore, should be looked upon as a prerequisite for graduate work, regardless of the field in which the graduate work is to be done. Preparation for general practice should be anticipated as graduate experience on a par with that which is currently considered necessary for the various specialties. Since the general practitioner in our mountain or desert areas may be required to function differently from one in a large city, the organization and conduct of our general practice graduate program is individualized to accommodate our local problems. This is in line with our philosophy that the work and program of every medical school should be oriented to the community it serves.

We have just established a department of general practice, headed by a well-qualified general practitioner. This department will be responsible for the admission examination of all patients entering our clinic or hospital system. Reference to specialty clinics will depend upon this careful admission examination. Clinics in general medicine and surgery will be operated by this department, and members of the general practice staff will share in the care of patients upon the medical and pediatric wards. Conversely, our specialty departments cooperate in the general practice training program by accepting the residents for specified periods of time. An attempt is made to individualize these assignments to meet the needs of our concept of general practice. All our residents, regardless of the field in which they are being trained, are registered in the clinical division of the graduate school and are encouraged to work toward graduate degrees.

As the result of cooperation with the Colorado State Medical Society and the Colorado State Hospital Association, arrangements have been made for the general practice residents to spend the last six months of their three-year program in qualified rural hospitals. The Committee on Medical Education and Hospitals of the Colorado State Medical Society has set up the minimal standards for rural hospital participation and will take care of the necessary inspection, certification and supervision. Teams of teaching physicians will visit these hospitals at regular intervals. The organization and supervision of this activity will also be the responsibility of the Medical Society committee.

With this as the setting for our residency in general practice, the three-year program is described briefly as follows:

The program is arranged so that each year-unit need not occur in any definite relationship to another.

One Year:

Medicine—eight months. (During this period a series of well-organized symposia and seminars is conducted with the idea of providing a practical review of the applied sciences basic to medicine. Psychosomatic medicine is particularly stressed.)

Pediatrics—four months (including work in the out-patient department).

Another Year:

Obstetrics and gynecology—five months (including work in the out-patient department).

Public Health—one month.

Assignment to rural hospital—six months.

Another Year:

Surgery—12 months (divided equally into four-month periods: fractures, emergency operations and ward assignments).

It should be noted that our department of psychiatry maintains a psychiatric service which limits its activities to the medical, surgical, pediatric and obstetric wards of our general hospitals. All our interns and residents are encouraged to evaluate every patient from the personality and emotional standpoint and to see that psychosomatic problems receive proper therapeutic attention. The psychiatric staff assigned to the general hospitals provides the supervision essential to this activity.

As soon as we began to receive applications for our general practice residency, we were struck with the frequency with which the applicants indicated that they did not desire surgical training other than that which was diagnostic, and that in its place they desired more training in general medicine. This has pleased us very much, as it is our feeling that in the not too distant future the average general practitioner will not be doing surgical operations or handling obstetrical cases. Consequently, we have provided an alternate third year so that those residents who do not desire the surgical training and rural hospital assignment may take additional training that is non-surgical in nature:

Alternate Third Year:

Psychosomatic medicine—three months.
General out-patient medicine—three months.
Physical medicine—one month.
Industrial medicine—one month.
Pediatric out-patient—three months.
Public health—one month.

Our general practice residency program is in the third year of its development. As would be expected, our ideas and approach are frequently changing as we manipulate the program. Consequently, there must be no surprise if what I have described above should be changed in the next few months. As of July 1, 1948, there were 14 general practice residents in training, and we hope that by 1951 we will be able to support a set-up which will carry approximately two to three times this number.

In order to complete the picture for the training of the general practitioner, postgraduate education obviously deserves consideration. We have been gratified by the increasing demand on the part of the general practitioners of our community for postgraduate work. It is well recognized that the best medicine is practiced where medicine is being taught. Consequently, we subscribe to the principle that we should integrate as many teaching physicians into our activities as possible. The participation of the staffs of rural hospitals in our residency training program is of the first importance in this regard. The stimulation which these staffs will receive from teaching residents and from the periodic visits of teaching teams constitutes excellent extramural postgraduate training.

At the request of our general practitioners, we are developing short refresher courses which cover specialty fields from the general practitioner standpoint. A recent one in obstetrics and gynecology was particularly successful. The course lasted two days. Five to ten minutes was taken by a competent teacher to present just one practical point. This was frequently followed by a demonstration and always by a general question and discussion period, following which another single consideration was taken up in a similar manner. This rapidly moving type of instruction very largely eliminated the fatigue common to the usual lecture type of program.

General practitioners are also coming to us with the request that arrangements be made for them to take individualized periods of training in some particular field. For example, one general practitioner has just finished spending six months with our division of psychosomatic medicine, and another is currently taking the same training. Many general practitioners are regularly spending from a half to a full day in our clinics as special students.

I am glad to know that a special committee of the California State Medical Society, with a salaried part-time chairman, is giving special consideration to the problem of developing a postgraduate program for its members in general practice, and we in Colorado will be most interested to compare notes from time to time.

The training of general practitioners is intimately tied up with the broad problems of medical care. A well-balanced system of medical care, whether it be urban or rural or depend upon group or individual practice, should in our opinion, hinge upon the physician who is qualified to take continuing responsibility for the individual patient. This physician, actively interested in preventive medicine, capable in diagnosis and appreciative of his limitations, can certainly fill an assignment that can be looked upon as one that is just as dignified and honorable as that filled by any specialist. This physician's most important job should be to keep his patient well and to make hospitalization as infrequent a necessity as possible. When serious or disabling illness strikes in spite of his efforts, he is the one to follow the patient, if necessary with the help of specialists, and to continue with his observation through the convalescent period with the aim of minimizing the chances of relapse, chronicity or disability. We should all realize that his maximum effectiveness will depend upon training and skill comparable to, if not greater than, that necessary for the practice of any of the specialties.

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Spontaneous Pneumoperitoneum

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SUMMARY

Spontaneous pneumoperitoneum most often occurs following ruptured peptic ulcer. In 80 to 85 per cent of cases of perforated ulcers, free intraperitoneal air is demonstrable. There have been reported three cases in which air was present without demonstrable cause, without peritoneal irritation or peritonitis. This presentation adds a fourth.

Examination of a patient with acute disease of the abdomen should include not only a roentgenogram with the patient supine but films made in the left lateral decubitus position and/or upright position to demonstrate free air. The radiologist should be ready and willing to consult with the surgeon at the time of examination. Attention is called to a sign described recently by Rigler in supine films, namely, the visibility of both the inside and the outside of the intestinal lumen. Another sign in the supine film, namely the contrast of air against the peritoneal reflections, is described.

PNEUMOPERITONEUM means simply free gas within the peritoneal cavity. It is induced therapeutically for pulmonary tuberculosis or tuberculous peritonitis or diagnostically to provide contrast for the intra-abdominal organs. The first mention of pneumoperitoneum in the literature was by Kelling[5] in 1902 who suggested its induction for diagnostic purposes. Many others since that time have treated this phase of the subject. This presentation will be concerned with spontaneous pneumoperitoneum.

Popper[11] in August 1915 first called attention to the possibility of pneumoperitoneum in ruptured peptic ulcer. Four years previously he had observed a patient with clinical symptoms suggesting peritonitis due to perforation, followed by spontaneous recovery. An x-ray study eight days following the acute episode demonstrated free air above the liver. In April 1915 Wieland[16] had found a similar sign in a patient with perforated ulcer, but necropsy showed that this radiolucent zone above the liver was due to transverse colon. In 1916 Lenk[6] observed the significance of free intraperitoneal air in penetrating wounds of the abdomen in soldiers. In the next few years many single cases of pneumoperitoneum were reported. During the past two decades a number of articles have been published reporting relatively large numbers of perforated ulcers in which the value of pneumoperitoneum in diagnosis was established.

CAUSES OF SPONTANEOUS PNEUMOPERITONEUM

The most commonly recognized cause of spontaneous pneumoperitoneum has been that of perforated peptic ulcer. This is so important a cause that Johnson[4] in 1937 felt that spontaneous pneumoperitoneum was pathognomic of perforated peptic ulcer. Most observers who reported on the subject in the 1920s found that pneumoperitoneum could be demonstrated radiologically in from 81.8 per cent to 85.7 per cent of patients with ruptured peptic ulcers. A single exception was Warfield's[15] series of 35 cases reported in 1929 in which free air was shown in 43.5 per cent. He felt that the lower percentage was due to increased use of radiography and increasing acumen of the clinician. However, Thaxter's[14] report, which was published as recently as 1940, agreed with the majority of the earlier reports.

An analysis of the records at the White Memorial Hospital for the ten-year period from 1936 to 1946 reveals among 84,441 hospital admissions a diagnosis of ruptured gastric ulcer 41 times and of ruptured duodenal ulcer 18 times, or a total of 59 ruptured peptic ulcers. Of the patients with gastric ulcers 37 were men and four were women. Of those having duodenal ulcers, 17 were men and one was a woman. This is in keeping with the higher incidence of ruptured ulcers among males reported in all other series. In 20 of the 41 cases of ruptured gastric ulcer, radiologic study of the abdomen was made at the time of the perforation. Sixteen, or 80 per cent of the studies showed evidence of free intraperitoneal air. Of the 18 patients with perforating duodenal ulcers, nine had x-ray examination at the time of the perforation, and in seven of these cases, or 77 per cent, there was evidence of free air. These percentages agree well with those given by the majority of observers reporting on this finding.

Other less common causes of spontaneous pneumoperitoneum have been described. Among these are carcinoma of the stomach, typhoid ulcers, tuberculosis of the appendix, perforated appendix, rupture of distended loop of bowel following obstruction or trauma, perforation of stomach by gastroscope, perforating abdominal wounds, rupture of urinary bladder, rupture of colon diverticula, and "pneumatosis cystoides intestinalis." At the White

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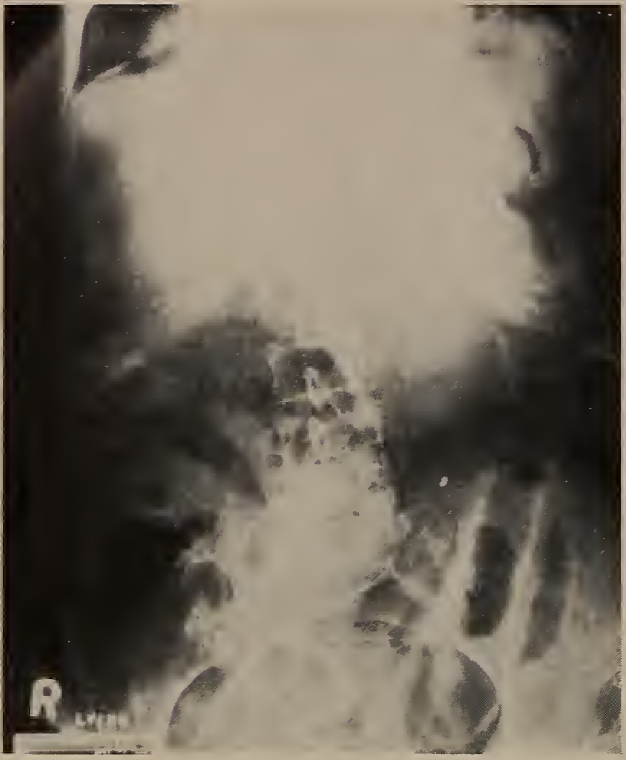

Figure 1.—The patient, an 86-year-old female, had a large rent in the stomach after eating a heavy meal. The exact cause was not found. Note, in the lower right, the large cecum with both inner and outer walls visible. This is a supine film.

Memorial Hospital, two cases of carcinoma of the stomach, and one case of perforation of diverticulum of the colon in which free air was demonstrated have been observed. Massive pneumoperitoneum was also seen in an aged woman who had an apparently spontaneous rupture of the stomach after a heavy meal (Figures 1 and 2).

To be considered in differential diagnosis is pneumoperitoneum which may be unintentionally induced. Some air almost invariably remains in the abdomen following laparotomy, especially if the surgeon has pulled up the anterior abdominal wall in an effort to secure the last suture. Pendergrass and Kirk[10] stated that air can be demonstrated for a period of 24 hours or more in 60 per cent of patients who have undergone laparotomy, and Rigler[12] stated that air may be observed for as long as three weeks following such procedure. Banyai[1] and others showed that pneumoperitoneum may complicate therapeutic pneumothorax in the treatment of pulmonary tuberculosis either by direct insertion of the needle through the diaphragm into the peritoneal cavity or possibly by way of the diaphragmatic hiati. It may also occur by way of the uterus as in the Rubin test, or the woman herself may induce it by the use of the bulb syringe or by using a gas-forming douche.

SPONTANEOUS PNEUMOPERITONEUM WITHOUT DEMONSTRABLE CAUSE

Hinkel[3] reported a case of spontaneous pneumoperitoneum without peritonitis, demonstrable visceral perforation or exogenous origin. He was able to collect only two such cases from the literature, one described by Moberg[8] and the second by Monod and Holiander.[9] In Moberg's case, the patient was an 81-year-old female with severe vomiting. Autopsy disclosed scirrhous carcinoma of the pylorus with stenosis but without perforation or peritoneal irritation. Monod and Holiander's case was that of a 35-year-old man with clinical signs of obstruction. At operation the gas escaped from the peritoneum with a hissing sound, but no peritoneal inflammation, intestinal obstruction, or other pathologic change was found. The patient recovered quickly. In Hinkel's case, the patient was a 70-year-old female with sudden severe pain in the epigastrium and lower chest aggravated by breathing. There was a history of dry cough for 15 years. The chest was limited in expansion and hyper-resonant on the left. The abdomen was distended and tender but not rigid. Roentgenograms revealed a large pneumoperitoneum below both diaphragms with elevation and some fixation of the left diaphragm. Roentgenograms following barium meal and enema were reported normal. Bronchography disclosed slight pooling of lipiodol at the left base against the elevated diaphragm. This pooling was thought to indicate emphysematous bullae. The patient was asymptomatic after two weeks, and was well one year later. The air remained in the peritoneal cavity for 21 days which suggested to Hinkel that the inlet remained open or reopened at intervals, since he thought the long duration precluded a single episode of air admittance. He felt that the emphysematous bullae at the diaphragm might have been responsible.

Rigler[12] described a patient in whom pneumoperitoneum was demonstrated on gallbladder films, but without material symptoms and without clinical evidence of perforation. Whether this truly represented a spontaneous pneumoperitoneum without demonstrable cause cannot be established as the patient did not return for further observation.

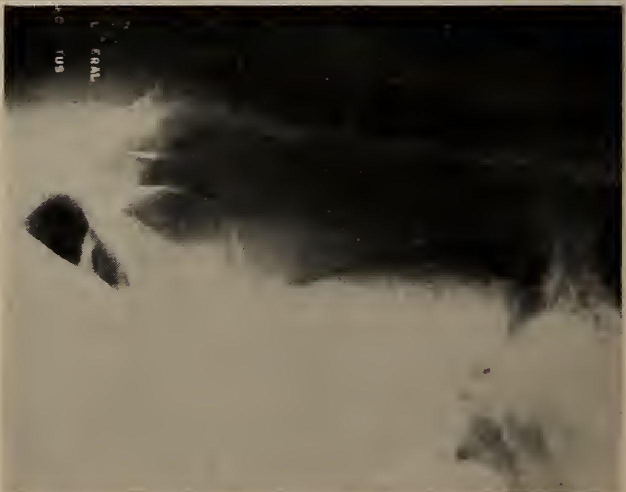

Figure 2.—Same patient as in Figure 5. Note the huge pneumoperitoneum. The balloon-like shadow at the left of the illustration is the cecum.

Maxfield and McIlwain[7] described a patient with spontaneous pneumoperitoneum found at fluoroscopy in a routine gastro-intestinal study. Five days previously he had suffered an attack of acute indigestion lasting for a few hours, followed by spontaneous remission and relief. A duodenal ulcer was demonstrated radiologically. This case may well be an example of what Singer and Vaughan[13] described as a "formes frustes" type of perforated peptic ulcer in which the symptoms quickly abate following the perforation, due, they feel, to rapid sealing or plugging of a tiny perforation. The patient had a demonstrated duodenal ulcer, so that it is possible for a small perforation to have occurred and quickly sealed itself.

To these reported cases of spontaneous pneumoperitoneum, for which the source of the air was not found, the authors would like to add an additional case.

CASE REPORT

The patient, a woman 81 years of age, entered the hospital complaining of increasing distention and abdominal pain for one week. The patient, when first observed, was semi-comatose and felt little pain. She had had previous similar, but much milder, attacks. The patient had a left inguinal hernia, and had had a stroke.

Examination: Upon examination, severe distention of the abdomen was noted. The abdomen was tympanitic and tense; no masses were palpable. There was no audible peristalsis, and the patient complained of no pain at that time. The blood pressure was 146 mm. of mercury systolic and 98 diastolic. Pelvic examination showed no evidence of pelvic masses. The leukocyte count on admission was 22,100 with 89 per cent neutrophils, of which stabs were 16 per cent. The urine showed a two plus reaction for albumin, numerous pus cells and occasional erythrocytes; no sugar or other pathologically significant components were found. X-ray examination disclosed a very large area of pneumoperitoneum visible even on the film taken with the patient supine (Figure 3). There was pronounced distention of the colon. An enema resulted in complete deflation of the colon as demonstrated on a subsequent film. The loops of small bowel could then be seen through the air, which outlined the peritoneal cavity (Figure 4).

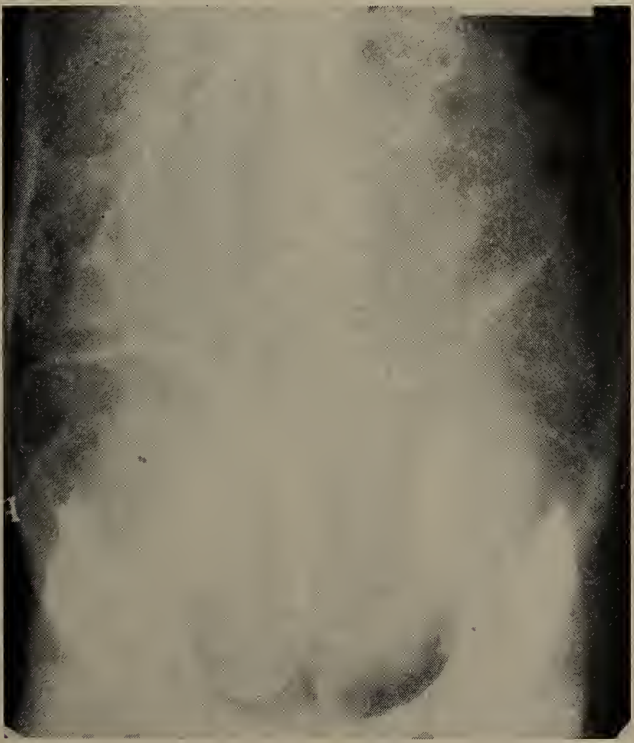

Figure 3.—Massive pneumoperitoneum in a patient without demonstrable cause (see text). Note the visibility of the outside as well as inside of the greatly distended large bowel. Note the air contrast along the lateral peritoneum. (Supine film.)

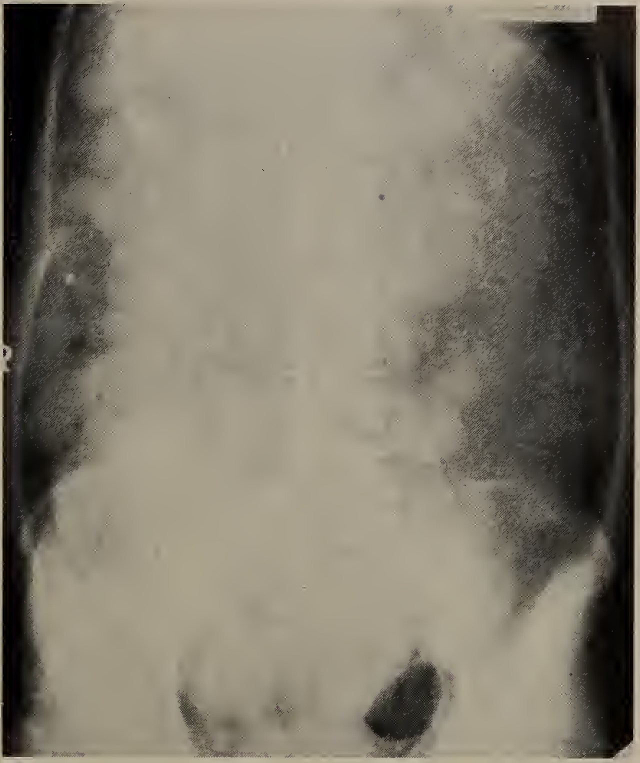

Figure 4.—Same case as shown in Figure 3. Deflation of the bowel after enema. The massive pneumoperitoneum is well seen against the lateral peritoneal walls. (Supine film.)

The surgeon stated that puncturing the peritoneal cavity was like puncturing a toy balloon. Large quantities of entirely odorless gas rushed out and the abdomen then became flat. The abdomen was gently explored and no evidence of peritonitis or free fluid was found. Both the stomach and the cecal area were explored. The small bowel and colon were deflated and small. The cause for the pneumoperitoneum was not determined. A culture made of a smear from the peritoneal cavity revealed an occasional Gram-negative bacillus which fermentation test identified as Escherichia coli.

Following operation, the patient received transfusions, and a Levine tube was inserted for feeding. The postoperative temperature record indicated a daily rise to approximately 100°. This febrile course continued and almost two months later a rectal abscess was drained.

Discussion: As in Hinkel's case, this patient was never very ill as far as the abdomen was concerned. She was old and senile, had had a stroke previously and was therefore slow in recuperating. There was evidence of infection in that the white count was elevated and the patient continued to run a low grade fever. This would suggest that there may have been a perforation in the pelvic colon not observed at the time of operation, and producing no peritonitis. It is to be pointed out, however, that the rectal abscess which probably caused the fever was extraperitoneal.

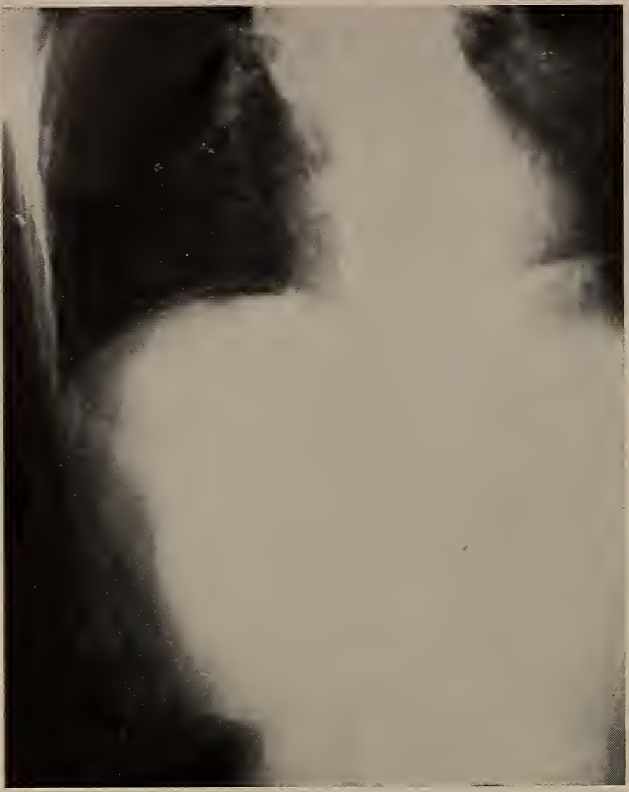

Figure 5.—Upright film of a patient with ruptured gastric ulcer. Note small quantity of free air between liver and diaphragm.

TECHNIQUE OF EXAMINATION

The practice of having the x-ray films of the "acute" abdomen reviewed by the surgeon at the time of the examination, especially those made at night, and not reviewed by the radiologist until his later convenience, is to be deplored. The roentgen examination of the "acute" abdomen is of such importance that it should be made under the supervision of the radiologist, who should also be willing to render an interpretation at whatever hour needed.

The day of the single supine film examination in cases of suspected acute abdominal conditions is past. Since ruptured peptic ulcer must be considered in most cases of acute diseases of the abdomen, study should always be made for the demonstration of free air. Classically, the film for this study is made with the patient standing, and this still remains the most widely used method for the demonstration of air. The film area should include the diaphragms; however, many patients are too ill for this procedure, and occasionally if the amount of air present is small it may not be visible by this means. Under these conditions, a left lateral decubitus film should be made. For this the patient is placed on the left side, remaining in this position for 10 to 15 minutes to allow small quantities of air to rise. The examination is made with the central ray directed horizontally and the film placed so as to include the right lateral abdominal wall and the right diaphragm. The advantages of this position over the upright view are: (1) The patient is more comfortable during the examination; (2) allowing the patient to remain on his side should theoretically make it possible to demonstrate smaller quantities of air; (3) this position will decrease the chances of further leakage from perforations in the distal portion of the stomach and duodenum; (4) it allows the examination of patients too ill to assume the upright position.

During the past several years, the practice at the White Memorial Hospital is to have all patients with the diagnosis of acute disease of the abdomen examined radiographically in three positions—flat supine, left lateral decubitus, and, if possible, upright.

X-RAY FINDINGS

The usual x-ray findings of free intraperitoneal air are well known. They depend to some extent on the amount of gas present in the peritoneal cavity. Friedman[2] thought that as little as 50 cc. of gas might be visualized on the radiograph. Rigler,[12] in working on cadavers, was able to demonstrate as little as 5 cc. of air, and with 20 cc. there was no doubt about air being present.

In the usual instance, it is not difficult to demonstrate a somewhat sickle-shaped rarefaction between the diaphragm and the liver representing the free air which has collected there. When there are large quantities of air the space between the liver and the diaphragm may be considerable. However, very small quantities of air are just as diagnostic as the larger amounts and should not be overlooked (Figures 5 and 6).

Rigler has described a sign of pneumoperitoneum seen in the supine films. This sign consists in the visibility of both the inner and outer walls of the bowel. It occurs only if there are large quantities of gas present. He described the sign as occurring most commonly in perforations of the colon. In the cases in which the authors have noted this sign, the perforations were in the stomach or duodenum. Another characteristic sign which is sometimes helpful has been noted, and that is the demonstration, in the lateral aspects of the supine film, of the

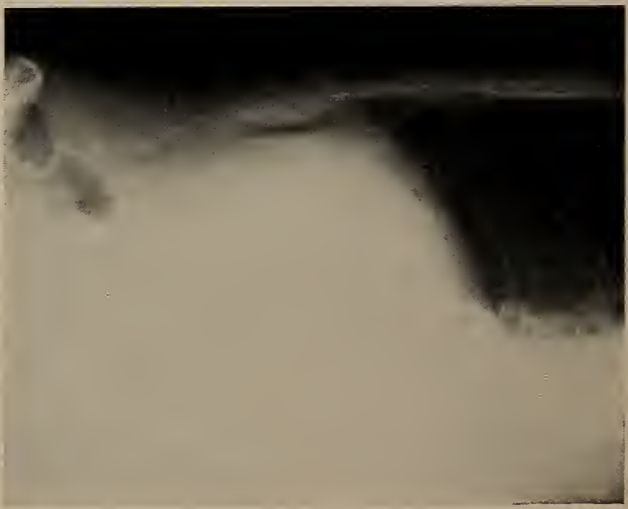

Figure 6.—Same patient as in Figure 5 in right lateral decubitus position. The free intraperitoneal air is seen laterally.

presence of air adjacent to the peritoneum or overlying the liver shadow (Figures 3 and 4). This is not as frequently seen, or as easily recognized, but when present should arouse suspicion of the presence of free air and lead to additional views such as the upright or lateral decubitus. It is well to keep these two signs in mind when viewing the supine film, since the authors have observed several cases in which the presence of a perforation was missed by competent radiologists who apparently were not aware of these signs or did not properly interpret them.

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Discussion by L. H. GARLAND, M.D., *San Francisco*

The diagnosis of pneumoperitoneum is relatively simple in well established cases, and the methods suggested by the authors are fully concurred in. However, differential diagnosis of very small amounts of air from collections of fat under the diaphragm is not always a simple matter. Projections in two different planes are of aid in reaching this differentiation.

For most patients with a clear-cut clinical diagnosis of ruptured ulcer, a single left lateral decubitus film made with a horizontal beam is usually all that is necessary. These patients need not be disturbed in order to make additional upright or supine films. However, when there is any question concerning the presence of free air, then additional views should be made.

We cannot share the authors' enthusiasm for bowel visibility as a useful sign. In the text of their article they point out that this is usually seen only with massive collections of air; it is therefore usually a late sign.

We have seen one case of idiopathic or cryptogenic pneumoperitoneum, that in a female who gave a history of taking vigorous knee-chest position exercises on the advice of a cultist. This finding was observed on two different occasions and needless to say caused considerable surmise.

As neither alimentary tract ulcer nor colon diverticulum was demonstrated, presumably the air gained admission via the fallopian tubes.

Accuracy in roentgenographic technique, plus consultation with the radiologist *prior* to the examination, will assure an even higher percentage of accurate diagnoses of pneumoperitoneum than is at present experienced. The authors are to be congratulated for emphasizing this point.

* * *

Operation for Congenital Cataract

Otto Barkan, M.D., *San Francisco*

SUMMARY

The traditional treatment of needling or discission of congenital cataract or membrane is open to many serious objections. Removal of the cataract by a modified form of linear extraction is recommended. The technique, with recent improvements which further assure extraction without hazard in early infancy, is described.

THE subject of congenital cataract is given relatively little space in textbooks of today. The traditional treatment of needling or discission, often repeated, is generally employed. Needling is open to many serious objections such as the danger of chemical irritation and secondary glaucoma, which not uncommonly necessitates further operation upon a highly inflamed eye. Other objections are protracted convalescence, the frequent necessity of repeated discission in order to complete resorption, and delayed restoration of vision in young subjects, with resultant amblyopia. Retinal detachment not uncommonly occurs in adult years as a result of repeated discission in early childhood.

Ziegler recommended the through-and-through incision, hoping to prevent secondary glaucoma. According to Spaeth[4] a through-and-through incision of the lens into the vitreous is not a guarantee against the development of secondary glaucoma; instead, damage may occur to the vitreous with later iridocyclitis, chronic in type, and even retinal separation.

Elschnig and Hess[2] recommended removal of the lens by "linear extraction" when the infant is three months of age for the relief of total cataract and at six months or later for partial cataract. Because of its danger, "linear extraction" was not generally accepted. A technique of "linear extraction," modified to avoid the danger and to permit safe removal of congenital (and membranous) cataract in infancy as well as later, was suggested in 1931 by the author of this presentation.[1] Favorable aspects of the technique were confirmed by Green and Beisbarth.[3] Additional modifications which have been introduced in the interval are given in the present article.

The essence of the procedure is to dilate the pupil maximally with atropine instilled for four days preoperatively and again with adrenalin 1:1000 by subconjunctival injection at operation. Thus the margin of the pupil comes to lie peripheral to the inner wound lip of the keratome incision. The incision is made obliquely in the cornea 1 to 1½ mm. axial to the corneoscleral border, and in a plane parallel to that of the iris. Designed as a trap-door or valve incision which is watertight and airtight as regards the contents of the anterior chamber, it prevents outflow of fluid or air and encourages rapid reformation of the chamber. This effect combined with maximal dilation of the pupil and the hypotony induced by adrenalin (dynamic since it is partly due to stimulation of the sympathetic) tends to prevent the iris from contacting or adhering to the inner wound lip. Inasmuch as anterior adhesion of the iris nevertheless occurred in some cases, a precautionary measure was instituted. This consists of postoperative reestablishment of the anterior chamber by means of injection of physiological saline solution through a prelaid corneal puncture. The patient leaves the operating table with the chamber fully reformed. Since this modification has been added to the original procedure there has been no instance of anterior adhesion. Cordes* recently injected a bubble of air postoperatively for the same purpose. The bubble is so placed, by positioning of the head, that contact of the iris with the inner wound lip is discouraged. The bubble of air may be combined with the saline injection.

In case a secondary membrane forms, it is suggested that this should not be "needled" or discinded. If the membrane is delicate it may be removed by gentle traction with the smallest capsulectomy forceps. If thick and tightly adherent, it may be cut at right angles to the line of traction with scissors of the Barraquer type. Both maneuvers can be performed with a high degree of safety by means of the surgical technique outlined in the preceding paragraph.

The absence of complications and the smooth convalescence are striking in contrast to the delay and complications of discissions. The establishment of clear media in early infancy is advantageous. No late complications such as retinal detachment have been encountered. There has been no case of sympathetic ophthalmia.

In the case of binocular total cataracts it is suggested that surgical intervention be started at the age of three months. After successful operation on one eye the other should be operated upon without delay. In the author's experience corrective glasses have been worn postoperatively with satisfaction in several cases at the age of four and five months. Since experience has shown that no useful purpose is accomplished by early operation in cases of monocular cataract, it is recommended that operation in such cases be deferred until a later age when full cooperation of the patient is obtainable.

Presented before the Section on Eye, Ear, Nose, and Throat at the 77th Annual Session of the California Medical Association in San Francisco, April 11-14, 1948.

*Personal communication.

SURGICAL PROCEDURE

A drop of 1 per cent solution of atropine sulfate is instilled once a day for 4 days in the eye to be operated upon. Pediatric examination, including a roentgenogram of the chest to determine if the thymus is enlarged, is performed in all cases. In the case of infants the usual diet is maintained up to six hours preoperatively; sugar solution is forced up to four hours to avoid dehydration with associated hyperpyrexia.

General anesthesia is used in infants and in children up to the age of 12 or 14 years. In view of the delicacy of the operation as applied to infants only a few months old, who may have other congenital defects, the importance of carefully conducted anesthesia cannot be overemphasized. An injection of atropine is given 45 minutes before operation. Ether is administered through a suitably small airway. Since the patient's face is covered with an eye sheet and the operation may take a long time, care must be taken to assure an adequate supply of oxygen at all times.

Before the surgeon scrubs and the patient is draped, two to four minims of adrenalin 1:1,000 are injected at several points along the upper limbus with a No. 30 one-half inch needle attached to a 1½-inch luer syringe (Figure 1). The intraocular action is increased by making the injection as close as possible to the corneoscleral border. The injection is facilitated by inserting the opening of the needle, facing the bulbus when puncturing the conjunctiva. It is best to inject the major portion at 12 o'clock in the meridian contiguous to the point of corneal incision. Akinesis and a retrobulbar injection of 2 per cent novocain are given, and the eye prepared in the usual manner. The face mask should be of moistened gauze so that it may be easily molded to the region.

After 10 to 15 minutes the pupil is maximally dilated so that it almost disappears behind the limbus and hypotony has developed. The dilation, being due to a contraction of the sympathetic dilator fibers, is tonic, in contradistinction to the paralytic dilation of atropine. The iris consequently maintains an exaggerated contractility which keeps it retracted from the wound and prevents it from prolapsing. The hypotony of the bulbus induced by adrenalin is such that the usual tendency of the ocular contents to prolapse is reduced. The tendency to prolapse is further discouraged by making the keratome incision oblique and within the cornea.

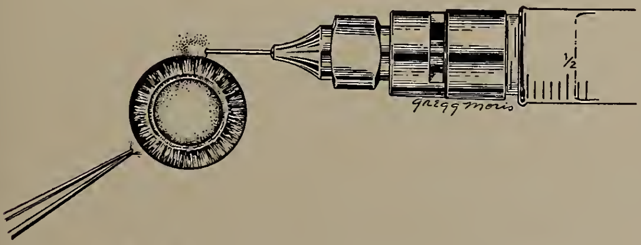

Figure 1.—Injection of Adrenalin 1:1000.

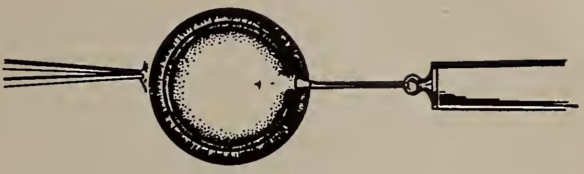

Figure 2.—Corneal puncture.

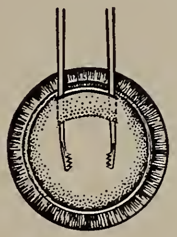

Figure 3.—Corneal incision and capsulectomy forceps.

Adequate exposure is provided by canthotomy and by lid sutures, six to eight in number, of No. 6 "0" black silk placed along the ciliary margins of the upper and lower lids. They are held by mosquito forceps. The superior rectus is controlled by a bridle suture of No. 6 "0" black silk.

Illumination and magnification are important. In the cases of membranous cataract, the focal illuminator will eliminate annoying reflections.

In preparation for the later deepening of the anterior chamber, a corneal puncture is made tangentially, 1 mm. axial to the corneoscleral border at 9 o'clock on the right eye and at 3 o'clock on the left eye after the site has been touched with an applicator dipped in tincture of iodine (Figure 2). The bulbus having been fixed by a Bishop-Harmon forceps at the opposite limbus, the puncture is made with a discission knife which has been dipped in fluorescein to mark the site. The wound canal should be at least 2 mm. long so that it will be air- and watertight. The tip of the knife should barely perforate Descemet's membrane as observed through a head loupe. It may be necessary to tip the blade backward a little in order to perforate the membrane. Care should be taken not to enlarge the puncture in removing the knife.

The corneal incision is made with a keratome at 12 o'clock, 1 to 1½ mm. axial from the corneoscleral border. It is placed obliquely to the corneal surface and parallel to the plane of the iris, thus forming a valve or trap-door incision so that the greater the pressure within the anterior chamber the greater the tendency for the incision to close. It should be no larger than necessary for the extraction of the lens matter or membrane as the case may be. Excessive obliquity may interfere with freedom of intraocular instrumentation but the size and obliquity can be adapted to the needs of the individual case to achieve an optimum of freedom of instrumentation, deliberate manipulation, security of healing, and elimination of hazards (Figure 3).

A number of different instrumental procedures have been described for the extraction of the various forms of congenital cataract and membranes. It is

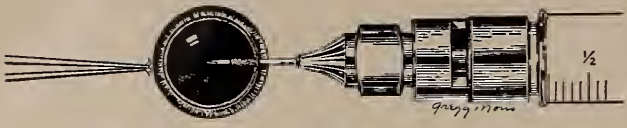

Figure 4.—Deepening of anterior chamber.

beyond the scope of this presentation to more than touch upon them. Depending upon the type of cataract or membrane to be operated upon and the preference of the surgeon, capsulectomy forceps, cystotome, narrow Hess shovels, irrigation, blunt hook and small delicate Barraquer scissors may be used. The various types of congenital cataract and their surgical implications have recently been described in a comprehensive review of the subject by Cordes.*

At the end of the operation the anterior chamber is deepened in the following manner: The corneal puncture which was prelaid with a discission knife and stained with fluorescein is touched with a dry applicator and with one dipped in tincture of iodine. With a No. 30 needle (previously drum-tested or examined under a loupe to assure its having a perfect point) attached to a 1½ cc. luer syringe, intravenous saline solution is injected, the surgeon fixing the bulbus at the contralateral limbus (Figure 4). (Air may be injected in the same manner, according to Cordes.) It is important that the anterior chamber be deep at the time the patient leaves the operating table.

The usual measures for postoperative care, consisting of binocular pads, eye shield, and arm restrainers, are carried out. Elixir phenobarbital is administered.

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Discussion by Frederick C. Cordes, M.D., *San Francisco*

We are indebted to Dr. Barkan for the introduction of his modification of the linear extraction. The procedure has justified itself in the years since its original presentation. The refinements in technique which Dr. Barkan has presented add further to its effectiveness. The operation is not difficult, but too much emphasis cannot be placed upon the care with which the details must be carried out.

In the surgical treatment of congenital cataracts it is important to remember that 50 per cent of the patients have other congenital anomalies and that therefore the prognosis must be guarded.

As a rule, visual acuity of 20/40 or better would seem to be a sufficient contraindication for operation. In some instances, as in the lamellar cataract, the opacity may increase in density so that operation later becomes necessary.

In those cases of bilateral congenital cataract where the opacities are sufficiently dense to interfere with the development of fixation, the first eye should be operated upon at six months so that the child may develop this faculty and thus avoid nystagmus. The second eye should be operated upon between the second and fourth year. It is well to remember that only approximately 50 per cent of the patients develop postoperative vision of 20/100 or better.

My personal choice of operation in most cases is the slightly modified form of the linear extraction advocated by Dr. Barkan.

After the routine preparation and anesthesia two minims of adrenalin 1:1000, are injected subconjunctivally at the limbus above. After ten minutes the pupil is maximally dilated and remains dilated even after the anterior chamber is opened. This, as Dr. Barkan states, prevents the iris from coming into contact with the incision before the anterior chamber is formed.

A suture is used through the tendon of the superior rectus as an aid in fixation.

Before making the incision a stab wound is made at the lower temporal limbus with a straight capsulotomy knife-needle to facilitate the injection of air into the anterior chamber after completion of the operation. If introduced parallel to the iris surface there will be no loss of aqueous. The site of puncture should be marked with gentian violet.

The operative procedure that I use follows that given by Dr. Barkan. Following the extraction of the lens, air is injected into the anterior chamber.

With a small luer syringe and a fine needle (28-30 gauge), the tip of which has been dulled a bit, air is injected into the anterior chamber until it has a normal depth. This injected air, which remains for several days, prevents the formation of anterior synechia and firmly closes the wound. The usual postoperative care is employed.

Complications: The complications encountered are not many and, to a great extent, can be prevented. Of importance is the injection of adrenalin and the necessary wait of ten minutes until the pupil is widely dilated so that the iris is not in the way.

The importance of the incision being parallel to the surface of the iris cannot be stressed too much, for it is this angle that produces the valve-like opening which seals firmly from the pressure within, and is a factor in preventing prolapse of the iris or opening of the wound by postoperative squeezing.

Vitreous loss is infrequent and, when it does occur, usually results from attempting to remove the last bit of lens substance. It is well to remember that when the major part of the lens has been removed there is little to absorb and this absorption occurs in a short time, even in those cases in which the lens is relatively immature. It is important not to "do too much."

The most serious objection that has been made to the operation is the development of anterior synechia, or iris incarceration in the wound, with the resultant drawing up of the pupil, which may at times be accompanied by glaucoma. The injection of air immediately following the operation seems to prevent this, as in no instance where this has been done has there been any iris incarceration.

Secondary glaucoma has occurred only once, and this in a 12-year old boy with a lamellar cataract that had increased in density to the extent that it caused sufficient loss of vision to necessitate operation. No difficulty was encountered in opening the wound and washing out the lens debris. The final result was 20/30 vision.

In certain types of congenital cataract, particularly the congenital membranous cataract, the discission as advocated by Wheeler is indicated.

In the disk-shaped cataract, where there are two types present (membranous central portion and peripheral soft cataract), a discission followed later by an incision through the membrane with Berens or de Wecker scissors is usually necessary.

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*To be published.

In rubella cataract, in addition to the possibilities of other anomalies being present, it is well to remember that the absorption of the lens substance is slower than it is in the case of the usual congenital cataract. In most instances it is difficult to dilate the pupil with any of the mydriatics.

The surgical treatment of congenital cataracts is a grave responsibility, as the outcome of the operation is instrumental in determining the individual's future position in society. A thorough knowledge of the types of congenital cataracts, combined with a detailed study of the case in hand, is important in deciding whether or not operation is indicated. If operative intervention is the decision this knowledge is useful in determining the age at which the operation is to be performed and the type of surgical procedure to be employed.

Discussion by DOHRMANN K. PISCHEL, M.D., *San Francisco*

In discussing Dr. Barkan's paper I wish to bring up the dangers inherent in the usual operation of discission. The author mentioned the fact that retinal detachment frequently occurred in adult life as the result of repeated discissions in childhood. This cannot be stressed too strongly. Some very pessimistic statistics have recently come out of England, where one author reviewed the results of repeated discissions. He came to the conclusion that well over half the eyes so treated became blind, largely from retinal detachment, between 20 and 30 years after the original operation. This certainly speaks in favor of some other form of operation for congenital cataract, and the technique described by Dr. Barkan is, I believe, to be highly commended.

Discissions or violent needlings of secondary membranes, or secondary cataract, also carry the danger of causing retinal detachments. I believe a needling should be done only if the membrane is very fine. In doing it, the needle should never be thrust through the membrane into the vitreous. The only safe way of doing a needling is to enter at the limbus, say at 3 o'clock, insert the point of the knife into the membrane, needle at 12 o'clock, then sweep the point downward towards 6 o'clock, but always keeping the instrument in the plane of the iris, never pushing the knife needle back into the vitreous. The point actually can lift the membrane forward, away from the vitreous.

If the membrane is at all dense, the only procedure which is safe is cutting it with scissors after making a keratome incision as described by Dr. Barkan. Here again, the scissors must be kept out of the vitreous as much as possible and all traction must be avoided. I recommend this technique very highly. I question the advisability of pulling out a membrane, no matter how delicate, except as a last resort, as I am fearful of fine strands running peripherally behind the iris, and ending in the retina. Traction on a membrane can thus be transmitted directly to the retina, causing a hole to be torn in it, thus precipitating a retinal detachment.

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Pediatric Anesthesia

M. Digby Leigh, M.D.,* *Vancouver, Canada*

SUMMARY

Induction of anesthesia in infants and children presents many problems not present in procedures for adults. Anesthetists may better serve the patient by visiting with him on the eve of operation, not only to establish friendly relations to avoid rebellion, but to form a basis for decision as to what anesthetic agent to use and by what method it should be given. As the kind of operation and the difficulties to be expected with each are large factors in the choice of agent and technique, a number of operative situations are reviewed from this standpoint.

The staffs of pediatric hospitals fit themselves into the child's world and on the whole the pediatric hospital lacks the solemn quiet atmosphere of the adult institution. One often sees brightly colored murals, children playing with toys, and hears a radio or phonograph. In addition, there is lively chatter between the children. Hospitals employ play therapists, occupational therapists, and school teachers, all of whom help to maintain the normal atmosphere of the child.

A further improvement has been the increased interest in the patient before and after anesthesia. No longer does the anesthetist appear in the operating room solely to give the anesthetic. It is customary in an organized department to have the anesthetist visit the patient the night before operation, have a friendly chat and gain the little patient's confidence. Children are intensely interested in stories of sport, and in the case of the young child, the subject of Santa Claus is a happy selection.

Over the years it has been learned that it is important to correct any fluid or nutritional imbalance. If the operation is elective, a good night's sleep prior to operation is beneficial to the patient. A barbiturate administered the night before accomplishes this purpose. If it is given orally, the bitterness should be concealed in a generous portion of corn syrup. Smaller children may be given a barbiturate suppository. Solid food, which might be vomited and aspirated, should be withheld for six hours prior to operation. Sweetened liquids can be given up to two or three hours preoperatively. In most instances, the patient who has had a bowel movement the day before operation does not require an enema. The exception, however, is the patient on whom rectal operation is to be done, with a possibility that feces would interfere with the operative procedure.

In regard to pre-anesthetic medication immediately before operation, some difference of opinion has arisen. Many anesthetists give no premedication to children under seven or eight years of age. Their aversion is due largely to the fear of dangerous depression of respiration. On the other hand, there is a rapidly growing group of those who believe that premedication in infants and children can give the same results as it does in adults. The advantages of the immediate preoperative premedication are decrease in fear and reduction in the amount of anesthetic agent required for anesthesia. This is attained with barbiturates or opiates. One of the belladonna group of drugs can be added to this, either atropine or scopolamine. Both atropine and scopolamine decrease secretions in the respiratory tract and help maintain the patency of the airway. Scopolamine also produces some amnesia of the operative procedure.

Since the anesthetist is aware of the type of operation, and is familiar with the patient's condition, he can make a decision the night before regarding the anesthetic agent and method to be used. It has been argued that there is perhaps one best technique for each case. The author feels that this is not strictly true—that there is usually a choice of three or four agents and methods, and that the breadth of choice depends upon the skill and the training of the anesthesiologist. Hitherto, open drop ether was thought to be sufficient and safe for most pediatric operations, such as tonsillectomies, herniorrhaphies, and appendectomies. It was found, however, that the open drop method was not suitable for intracranial, intrathoracic and intra-abdominal operations. Therefore it was found necessary to adapt to infants and children some of the improved anesthetic agents and methods used for adults. Consequently, we now have a wide variety of anesthetic agents employed. These include the inhalation agents —cyclopropane, ethyl chloride, ethylene, divinyl ether, ethyl oxide (ether), chloroform, and nitrous oxide; the local anesthetic agents—cocaine, metycaine, nupercaine, pontocaine, and procaine; the barbiturates—pentothal and evipal; the muscle relaxant—curare; the basal anesthetic agents—ether in oil, paraldehyde, and tribromethanol in amylene hydrate. Likewise, there is the same variety of anesthetic methods: open drop, semi-open, insufflation, and absorption (both to-and-fro and in circuit techniques). Moreover, today in inhalation technique the endotracheal tube is employed more frequently.

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Other methods, such as intravenous, rectal, topical, infiltration, field blocks and nerve blocks (cervical, brachial plexus, caudal, and even spinal) have found their way into the pediatric field. Almost all agents and methods that are employed for adult anesthesia have been used successfully in infants and children with almost comparable benefits to both patient and surgeon.

There are numerous operations on the respiratory tract in which the problem of anesthesia is complicated. For example, anesthesia for a tracheotomy may be difficult because of respiratory obstruction. However, much of this may be overcome if a small endotracheal tube is passed beyond the laryngotracheal obstruction and a patent airway established early and maintained. The insertion of the endotracheal tube usually relieves anoxia and passive congestion so that during the incision there is less bleeding. The method of administering the anesthetic can be any one of the usual inhalation techniques carried on through the endotracheal tube. After the completion of the opening in the trachea, the surgeon should infiltrate with a local anesthetic the skin around the tracheotomy incision. As the tracheotomy tube is inserted the endotracheal tube is withdrawn. Following this the administration of the anesthetic can be continued by insufflation through a rubber catheter inserted into the tracheotomy tube. The local analgesia, however, is usually sufficient to allow for the suturing of the skin.

Difficulties may arise during anesthesia for bronchoscopy. If the procedure is being carried out in infants for examination or aspiration, no general anesthetic agent is administered, but the infant is given high oxygen inhalations by bag and mask for three minutes prior to insertion of the bronchoscope. This will provide an adequate reserve of oxygen in the respiratory tract, circulating blood and other body tissues should laryngospasm or bronchospasm occur. Older children may be anesthetized in this way, after a thorough local anesthetization of the pharynx and larynx. The author usually gives nitrous oxide before and during the procedure.

Bronchoscopy for foreign body extraction is a different problem. It is true that the foreign body can be extracted under general anesthesia with ether; but ideal working conditions for the surgeon may be provided by giving a combination of nitrous oxide and oxygen, a small dose of intravenous pentothal sodium, and a comparatively large dose of curare sufficient to relax all the muscles and prevent any resistance. The accompanying respiratory depression or arrest would cause anoxia; but this can be avoided by delivering oxygen through the sidearm of the bronchoscope. If there are a few holes along the wall of the bronchoscope, then, even if it is inserted into one bronchus, gas can still flow into the other lung. The anesthetist may have to aid respiration by intermittent manual pressure on the upper part of the abdomen. If this is not sufficient he can put his thumb over the opening of the bronchoscope and inflate the lungs rhythmically. During this procedure the chest should be watched closely so that there is no overdistention of the lungs.

The choice of a safe and satisfactory method of anesthetizing infants and children for bronchograms is always a problem. There are two main difficulties: first, the maintenance of a patent airway; second, the limitation to non-explosive agents. In the last few years the anesthetist has become increasingly aware of the dangers of explosive agents in the radiological department. In older children, the usual premedication of morphine and scopolamine is given. On the patient's arrival in the operating room a large dose of morphine is given intravenously. The pharynx and larynx are sprayed with 10 per cent cocaine or 2 per cent pontocaine. If the child is uncooperative, this spraying can be done alternately with nitrous oxide and oxygen inhalations administered with a bag and mask. The radiopaque catheter can be passed down through the nostril and inserted between the vocal cords by direct vision through the laryngoscope. In infants the procedure is exactly the same except that the morphine is omitted and the anesthesia must be maintained throughout with nitrous oxide and oxygen with bag and mask; otherwise, satisfactory films cannot be obtained. It is wise to have on hand an endotracheal tube and laryngoscope in case the air passage becomes blocked with the radiopaque substance. If this occurs the clean endotracheal tube can be inserted quickly.

OPERATIONS IN THE THORAX

Operations in the thorax in most infants and children should be done with an endotracheal tube in place. This prevents respiratory obstruction, and, with the closed absorption technique, permits of easy control of pulmonary ventilation. The endotracheal tube facilitates aspiration of tracheobronchial secretions. In the smaller infants, completely closed endotracheal absorption technique is not satisfactory. If the absorption technique is used it must be carried on as a semi-open system. In other words, an excess of gases is supplied. If absorption in circuit is used, it is important to be sure that the system is efficient and that there is no rebreathing. Usually the system is connected with a Neff water manometer so that overdistention of the lungs cannot occur. This manometer is set at approximately 12 cm. of water pressure. If the anesthesiologist controls the breathing by rhythmic manual compression on the breathing bag, any excess pressure will be reduced by the escape of the gas through the open arm of the Neff manometer. This system provides uniform inflation of the lungs. (Uneven expansion of the lungs is disturbing to the surgeon.) These principles apply to practically all intrathoracic operations. It must be kept in mind that lobectomies and pneumonectomies in children are often done for bronchiectasis, and there is a great deal of secretion that must be aspirated frequently throughout the operation lest the patient drown. Postural drainage and bronchoscopic aspiration immediately before operation are seldom completely adequate.

In arterioplasty, including repair of patent ductus, coarctation of the aorta, and tetralogy of Fallot, usually one lung is collapsed and the other must be kept ventilated throughout the operation.

In tetralogy of Fallot, the problem of acute anoxia is always at hand. In these cases constant vigil of the heart is important. Should the heart beats become slow and feeble, the surgeon should permit the anesthetist to inflate the collapsed lung in order to improve the oxygenation. This should change the sluggish heart beats to more rapid, vigorous contractions.

In all intrathoracic operations, at the time of the closure of the chest, the anesthetist attempts to inflate the lungs by pressure on the breathing bag. Negative intrathoracic pressure should be applied in all cases before the patient leaves the operating room. Gentle transfer from the operating table is important. Oxygen therapy should be administered continuously from the end of the operation until it is no longer necessary.

There are several operations in the region of the upper part of the digestive tract which are beset with hazards. (The term "digestive tract," as here used is in accord with the "Standard Nomenclature of Disease and Operations" of the American Medical Association.) Deaths have been recorded from cleft lip and palate operations and from tonsillectomy and adenoidectomy. Deaths from tonsillectomy are far more common than is generally known. For example, in figures tabulated by Bishop from the United States Bureau of Census, there were 542 deaths during tonsillectomy and adenoidectomy in 6,250 deaths which occurred on the operating table over a period of ten years. A large number of these deaths probably were due to obstruction to respiration. The popular method of anesthetizing patients undergoing these operations was to commence with open drop ether technique followed by ether insufflation, either through a mouth hook or through a nasopharyngeal catheter. With this method it is important to keep the patient in the Trendelenburg position so that the blood will not run into the trachea and obstruct it. Likewise, the mouth gag must not be opened too widely, for this also blocks the air passage. It is because of this difficulty with the patency of the airway that for the past six or seven years the author has used the endotracheal method, preferably the orotracheal. If the endotracheal method is used, tubes of the proper size must be inserted; otherwise laryngitis may follow the extubation. In fact, in over 20,000 intubations in infants and children, two tracheotomies were necessary postoperatively. One was performed the day following a tonsillectomy, and in the other, the operation followed injury to the left recurrent laryngeal nerve during ligation of a patent ductus. It is presumed that the paralysis of the left vocal cord together with some subglottic edema produced enough obstruction to endanger the patient's life. Tracheotomy was done within an hour of the operation and the opening was closed 48 hours later.

Recently, the author reported a series of 500 operations for cleft lip and palate with only three deaths. These too were done with endotracheal anesthesia. The endotracheal technique provided improved operative conditions for the surgeon. It must be remembered that the technique is not for the occasional anesthetist but for the expert. In infants under two years of age blood was supplied throughout these operations.

In operations for closure of a tracheoesophageal fistula, a different problem presents itself. In the first place, the operation is done during the first few days of life when pain sensation is at a minimum. Cyclopropane and oxygen blown over the face of the infant through the bag and mask provides adequate anesthesia; but an endotracheal tube and laryngoscope should be kept on hand in case of the sudden appearance of severe laryngospasm. In operating upon infants two or three days old, a new feature appears. These infants often lose body heat, and the body temperature may drop to 94° or 95° F. unless it is kept higher artificially. This can be done by placing the infant upon a blanket-covered perforated metal frame which is placed over hot water bottles. Falling temperature is not a problem in older children, in whom the body heat tends to rise during anesthesia.

PYLOROMYOTOMY FOR PYLORIC STENOSIS

A comparatively common operation in a pediatric hospital is pyloromyotomy for pyloric stenosis. The infant is operated on at about three weeks of age. Careful preoperative preparation with intravenous fluids and blood is a matter of great importance. Many surgeons prefer anesthetization by local infiltration of the abdominal wall in the region of the incision. Others, feeling that local anesthesia interferes with healing of the wound, prefer open drop ether, although in patients anesthetized by that method the intestine often bobs up and down elusively. Cyclopropane blown over the face through a bag and mask can also be used but is difficult to control. A safe method for the expert and one which gives excellent operating conditions is a combination of intravenous pentothal and curare with nitrous oxide and oxygen inhalation. An endotracheal tube may be employed and is a definite asset if some assistance to respiration is required. But again, the latter is not a method to be employed except by those well versed in pediatric anesthesia.

There are several other abdominal operations, such as anastomosis of the intestine, reduction of a volvulus, intussusception, choledochoplasty, appendectomy, and splenectomy, for which the patient can be anesthetized with the same agents and methods as outlined for pyloromyotomy. In older children, over five or six years of age, spinal anesthesia may be employed. In fact, in one pediatric hospital, spinal anesthesia is used in 10 per cent of the cases. Spinal anesthesia is usually combined with intravenous pentothal or a very dilute concentration of nitrous oxide in oxygen administered by bag and mask. In children the surgeon should not expect the same contracted ribbon-like intestine that is seen in adults under spinal anesthesia. Perhaps the anesthetist is more cautious with children and keeps the level of analgesia lower.

Most urogenital operations can be accomplished with any of the anesthetic agents and methods used for adults. Caudal blocks and low spinal anesthesia can be used more frequently for these operations. In some cases circumcision can be satisfactorily done with a regional block at the base of the penis.

When operations on the endocrine system, thyroidectomy, thymectomy and adrenalectomy, are necessary for older children, the problems of choice of agent, method, and endocrine management are similar to those for adults.

With the rapidly growing group of trained neurosurgeons, neurosurgical operations such as craniotomy, cranioplasty, removal of subdural hematomata, and meningocele are increasing in number. Light anesthesia is required in these cases but a patent airway is essential. The so-called Ayre's open endotracheal method or the open valvular endotracheal method gives reliable results. Nitrous oxide and oxygen with the occasional addition of a small amount of ether is adequate for a light level of anesthesia. Proper oxygenation and carbon dioxide elimination, so important in these operations to prevent brain swelling, can be maintained for long periods of time. With these methods smaller endotracheal tubes can be used, which will materially reduce laryngitis following these protracted operations. Slightly different agents and methods must be used for anesthesia during encephalography because of the spark hazard. Intravenous and rectal pentothal and rectal avertin have been employed successfully. If the encephalography is not done by an expert, the patient may die during the procedure after only brief distress. Usually there is a slight coughing spell with sudden pallor and the patient dies in spite of immediate artificial respiration. This is more apt to occur in infants under one year of age.

There are many kinds of eye and ear operations in infants and children. Several of these are done under anesthesia induced with rectal avertin and with insufflation of nitrous oxide and oxygen through the nipple of a Waters' oropharyngeal airway. However, to avoid interfering with the surgeon's access to the patient's head, the endotracheal technique seems preferable, and it also gives a better guarantee of the patency of the airway.

Following operation, most patients are taken to a postanesthetic recovery room where they are carefully watched by nurses trained for this duty.

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End Results of Thoracolumbar Sympathectomy for Advanced Essential Hypertension

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SUMMARY

In a six-year period from February 1942 to February 1948, 473 patients (185 males and 288 females) were operated upon for essential hypertension and most of them were in advanced stages of hypertensive disease.

Patients were selected or rejected for operation on the basis of a set of rules drawn to guide clinical judgment.

The total of deaths in and out of the hospital over this period was 79 or a total mortality of 16 per cent. There were 38 in-hospital deaths, or a mortality of 8 per cent. The causes of deaths occurring in the hospital were in the following order: cerebral accident, cardiac failure, and renal insufficiency. The out-of-the-hospital deaths were in the following order: cardiac failure, cerebral accident, and renal insufficiency.

Operations done early in the series followed the Smithwick procedure from T-9 through L-2, but later the minimal procedure was extended from T-3 through D-3, and in addition about 40 total sympathectomies which included the stellate ganglion were done. Results from the more extensive operation were better than those from the lesser procedure, but the mortality also was greater. Conclusion that complete or nearly complete sympathectomy is preferable to a less extensive procedure must await the collection of more data which can be used in weighing the respective end results against the mortality.

Thoracolumbar sympathectomy has a definite place in the treatment of hypertensive vascular disease, but its role in advanced cases is chiefly that of palliation.

THE surgical treatment of hypertension had its origin in the pioneer work of Crile,[3] Adson and Craig,[1] Heuer and Page,[6] Peet[10] and others, but it was not until 1940 when Smithwick[13] first reported his clinical studies that an efficient operative procedure was made known. The method described by Smithwick and employed by him for the past nine years includes removal of the thoracolumbar chain from the eighth or ninth thoracic ganglion through the first or second lumbar ganglion, along the portions of the greater, lesser, and least splanchnic nerves.

In a series of 375[7] thoracolumbar sympathectomies with follow-up of the patients for six months to five years, we had 38 fatalities either in the hospital or within six months following the operation. In an attempt to lower this mortality rate we analyzed the status of the 38 patients who died and that of the 337 surviving patients, and arrived at a set of rules which theoretically would reduce the mortality rate to 2.5 per cent. This figure would be reasonably low in view of the fact that each patient undergoes two major operative procedures and many are recognized as poor risks.

Following the lead of Keith, Wagener and Barker[9] who graded the eyegrounds of hypertensive patients from 0 to 4 plus, we have utilized a similar method for grading the cerebral, cardiac and renal status of each patient. In order to do this satisfactorily we require, in addition to a careful history and physical examination, the following studies: Examination of the fundus, electrocardiography, a 6-foot heart film, a concentration test (pitressin or Mosenthal), urea clearance, blood urea nitrogen, non-protein nitrogen and creatinine determinations and urinalysis. Intravenous urography was applied routinely in the work-up of the first 150 patients until one death and two marked reactions associated with the injection of dye caused us to abandon it unless there was a significant indication for its use.

In Table 1 we have outlined a system of rules which serve to evaluate the degree of damage present in each of the four important organs, brain, eye, kidney, and heart, as a result of the hypertensive state. Any patient with ten or more pluses in all probability should not be operated upon.

A system such as this one, not based on mathematical data, must be interpreted in the light of clinical judgment, and it is implied that the operator has had a moderate amount of experience in the technique of thoracolumbar sympathectomy. The rules have aided us considerably and may be of help to internists and surgeons interested in the surgical treatment of hypertension.

It is very important to the surgeon and the internist to have clear-cut indications for accepting or rejecting these advanced cases for operation. It is our feeling that death occurring six months postoperatively indicates an unwise selection of patients for thoracolumbar sympathectomy. The only exception to this rule is the case in which papilledema has produced total blindness, and operation is per-

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TABLE 1.—*Rules for Evaluation of Symptoms in Indications for Operation*

Symbols Used	Eyes	Cerebrum	Heart	Kidneys
0	Normal	No signs or symptoms	No signs or symptoms	Normal
1 +	Arteriolar narrowing	Headaches and/or dizziness and nervousness	Slight symptoms and/or slight enlargement and slight e.k.g. changes	Nocturia; but concentration 1.024 or more; urea clearance 75% or more
2 +	Arteriolar narrowing and arteriovenous nicking	Headaches and/or nosebleeds and/or occipital headaches and/or dizziness and nervousness	Moderate symptoms and/or moderate x-ray enlargement; moderate e.k.g. changes	Urea clearance 40-75%; concentration 1.015-1.023
3 +	Arteriolar narrowing and arteriovenous nicking and hemorrhages and exudates	Headaches and/or nosebleeds and/or occipital headaches and/or dizziness and paresthesias	Marked symptoms and/or marked enlargement and marked e.k.g. changes	Urea clearance less than 40%; concentration less than 1.015; normal blood chemistry
4 +	Arteriolar narrowing and arteriovenous nicking and hemorrhages and exudates and papilledema	Stroke or encephalopathy or confusion	Coronary occlusion or congestive heart failure	Persistent elevation of n.p.n. to 40 mg. or more and b.u.n. to 20 mg. or more

formed to restore vision. Even when this objective is attained, it must be understood by the patient and his family that life expectancy will not be changed by this procedure.

INDICATIONS FOR OPERATION

Ocular Fundus: It may be stated categorically that in our experience no changes in the eyegrounds per se, with the exception of marked arteriosclerosis in conjunction with evidence of marked arteriosclerosis elsewhere, are to be thought of as contraindicating operation. Failing vision is in most cases an urgent criterion for operation, often in the face of other findings which ordinarily might be considered as militating against surgical intervention.

Cerebral Vessels: The status of the cerebral vessels has been the cause of great concern. Clinically, attempts to predict occlusion or hemorrhage in the vessels of the brain are notoriously futile. However, in our experience, aside from a persistent hemiplegia of less than six months' duration the most dependable evidence of cerebral damage, and therefore a contraindication to operation, is mental confusion, however slight, as evidenced by the usual signs of organic brain defects, particularly recent loss of memory. Such defects were most frequently seen in the presence of other signs of generalized arteriosclerosis. Paresthesias, dizzy spells and headaches are noted in Table 1.

Cardiac Status: In considering the cardiac status of a candidate for sympathectomy, the most important consideration (granting a high degree of surgical competence and skillfully conducted anesthesia) is the history of functional cardiac capacity. Cardiac failure is not in itself a contraindication, but when it completely fails to respond to the usual therapeutic procedures it is an absolute contraindication. The electrocardiogram has been of value most frequently in verifying the diagnosis of recent myocardial infarctions. In such instances it has been our policy to defer operative intervention for eight weeks or longer depending on the severity and extent of the infarction. Evidence of marked left ventricular enlargement has been seen frequently and, other factors being equal, is an indication for operation. Improvement in the electrocardiographic tracing may be expected in a high percentage of cases.

Renal Status: Renal decompensation as reflected in elevated circulating nitrogenous waste rules out the advisability of operation, whatever the underlying renal pathologic changes. In reviewing the operation and postoperative mortality data it is apparent that renal pathologic change as determined by elevated blood urea nitrogen above 18-20 mgm. per 100 cc. and nonprotein nitrogen above 40 mgm. per 100 cc. constitutes one of the most reliable preoperative guides from the point of view of both immediate and remote prognosis in hypertensive patients. Of the fatalities, half the hospital deaths, and almost half the postoperative deaths were among patients who had circulating nitrogenous wastes above those levels. This, of course, is a gross test of renal competence, yet for us it has been highly reliable, especially in the absence of other gross evidence of renal damage, such as marked albuminuria, hematuria, and anemia. Borderline levels must be considered in the light of other findings, and the closer the levels are to the upper limits of normal, the less confidence the surgeon has in making a decision. Poor renal concentration alone has not been considered a cause for withholding operation. Urea clearance determinations were done routinely, but their reliability was frequently questionable due to the difficulty of adhering rigidly to the technical requirements of the test. Additional and perhaps more refined tests of renal competence would undoubtedly have revealed evidence of renal damage in other patients with established hypertension, but for purpose of preoperative evaluation their inclusion would seem to offer little of critical value. Intravenous pyelography was rarely of any value and was soon discontinued, except when clinically indicated. In the preoperative evaluation of the status of an organ, problems such as the following may arise: the renal concentration test may be only 1.013, whereas the urea clearance may be 85 per cent of normal. In that case we have one test placing the kidney in a 3 plus category and the other in a 1 plus. We therefore average the two and consider the degree of damage as 2 plus. Similarly a patient may have excellent cardiac function, that is, he may have no dyspnea, or angina after climbing three flights of steps, and yet the electrocardiograms and x-ray film of the chest may show moderate (2 plus) changes. It is a matter of judgment whether the patient should be classified as having 2 plus or 1 plus cardiac insufficiency.

A complete blood count, a sodium amytal test (9 grains divided into three hourly doses) and a basal metabolism test are desirable but are not emphasized in evaluating the patient's status for sympathectomy. A high basal metabolic rate associated with hypertension is suggestive of pheochromocytoma.

The response of the blood pressure to deep barbiturate sedation or the autonomic blockade, as by tetraethylammonium chloride, is a useful device for testing the capacity for relaxation of the arteriolar bed and theoretically anticipating the result. The sodium amytal test is a good indication of a probable postoperative blood pressure result but is not absolutely accurate as a prognosticator in any given case. In our series no patient was turned down solely on the basis of a poor response to sodium amytal.

The etamon test (tetraethylammonium chloride) has been studied by Poindexter and Tamagna and compared with the sodium amytal test in over 50 patients.[12] In approximately 75 per cent of the cases the two tests correlated exactly while in the remaining 25 per cent there was a variation in both directions. No postoperative evaluation of the usefulness of the etamon test has been made. In a group of 94 patients studied by Hinton and Lord[8] an immediate postoperative drop in pressure was obtained in a high percentage of cases that was consistent with the drop obtained with sodium amytal. However, in a significant group no consistent correlation was noted. The effect of autonomic blockade with tetraethylammonium chloride closely parallels the results obtained with sodium amytal.

Smithwick[14] has stated that patients with a hospital diastolic pressure of 140 mm. of mercury and above do not respond satisfactorily to thoracolumbar sympathectomy. Among 24 males with a diastolic pressure of 140 mm. or higher he reports 20 deaths, three slightly improved, and one markedly improved. The results in our cases in this category are at variance with Smithwick's findings, as shown in Table 2.

TABLE 2.—*Results in the Cases of 104* Patients Whose Postoperative Diastolic Pressure Exceeded 150 Mm. of Mercury*

Died: In hospital, 13 (12.5 per cent); of hypertensive vascular disease: in 3 to 11 months postoperatively, 8; within 18 months, 1.

Mean Postoperative Diastolic Pressures

	Follow-up	
	One Year	Two Years
Resting	123 mm. (39 patients)	129 mm. (17 patients)
Exercise	117 mm. (35 patients)	121 mm. (15 patients)

*Five patients were not followed.

TABLE 3.—*Results for 72* Hypertensive Patients, Aged 50-59 Years, Subjected to Sympathectomy*

Died: In hospital, 4 (5.5 per cent); died of hypertensive vascular disease: in 3 to 6 months, 2; in 7 to 12 months, 3; in 18 to 24 months, 2.

Summary of Diastolic Pressure of 58 Living Patients

Follow-up (months)	6	12	24	30	36	48
Patients	10	33	12	1	1	1
Resting, 110	6(60%)	20(60%)	8(66%)	1	1	0
Exercise, 110	9(90%)	20(60%)	7(58%)	1	0	0

*Three patients were not followed.

De Takats and co-workers[4] have emphasized the importance of operation in patients under 40 years of age having a diastolic pressure not exceeding 120 mm. of mercury. Our experience with the older group would seem worth recording and is presented in Table 3.

OPERATIVE PROCEDURE

We place our patients in the exact lateral position with the lower leg flexed and the upper leg extended. The kidney rest is elevated under the lower costal region. The tenth rib is resected subperiosteally in its entirety. The parietal pleura is then carefully reflected from the posterolateral chest wall exposing the diaphragm which is divided in its entirety on the operative side. Retraction of the parietal pleura subdiaphragmatically with contained lung and retroperitoneal fat is facilitated by two large Harrington splanchnic retractors. With the wide exposure, delineation of the greater, lesser and least splanchnic nerves along the lower thoracic and upper lumbar sympathetic chain is not difficult.

The greater splanchnic nerve is divided at its junction with the celiac ganglion. The chain is grasped with a long curved hemostat and carefully dissected from each intercostal artery and vein. The communicating rami are divided several millimeters from each ganglion and the chain is divided just below the third lumbar ganglion. The twelfth ganglion is usually located just above or in the substance of the diaphragm and we have repeatedly noted how attenuated the chain is between the twelfth thoracic and the first lumbar ganglion. The thoracic chain is pursued cephalad until the third ganglion is mobilized and division is carried out above it. In the majority of instances the greater splanchnic nerve has its origin from the thoracic ganglia, sixth, seventh, eighth and ninth. The lesser and least splanchnic nerves are removed as the thoracic chain is mobilized.

One of the interesting findings is the wide variation in the size and distribution of the nerves. The minimum operation in a series of 473 cases included nine thoracic ganglia through the second lumbar ganglion with removal of the greater, lesser and least splanchnic nerves. This was done in about 35 per cent of the cases reported. The operative procedure is now much more extensive. In about 40 cases we have included the stellate ganglion through the third lumbar ganglion with all the splanchnic nerves. The minimal operative procedure as we do it now includes the third thoracic ganglion through the third lumbar ganglion with all the splanchnic nerves. It is obvious that the more radical the operation the higher the mortality, but also the better the end results.

PRECAUTIONARY MEASURES

As a result of our experience with 473 patients subjected to the two-stage thoracolumbar sympathectomy during the past six years, or from February 1942 to February 1948, certain principles of management during the operative and postoperative periods have evolved. The patients need every possible support to bring them through without a serious complication due either to their disease — for example, coronary occlusion, heart failure, cerebral accident or renal failure—or to a complication of thoracotomy such as pleural effusion, pneumothorax, atelectasis or pneumonia.

There are two basic problems to be handled during the operative and early postoperative periods: first, the maintenance of adequate blood pressure, thereby avoiding a sharp drop in systolic pressure to levels of 100 mm. of mercury or lower, which may occur with alarming suddenness, especially during and after the second stage procedure; and, secondly, the management of the thoracotomy during and after operation. The maintenance of a relatively stable systolic pressure has been best achieved by the use of 2 cc. of a 1 per cent solution of neosynephrine in 1,000 cc. of 5 per cent glucose in distilled water administered intravenously during the operation; and postoperatively, by using the same fluid with 1 cc. of neosynephrine per 1,000 cc. of solution until the systolic blood pressure has become stabilized at 90 or 100 mm. of mercury or higher. This may take only a few hours or it may take as long as 48 hours. Before this method was introduced, the anesthetist injected intramuscularly or intravenously 2 or 3 minims of neosynephrine when necessary and the same procedure was used postoperatively.

We have found that moderate anemia develops after each stage of the extensive sympathectomy, probably due to oozing into the extrapleural and intrapleural spaces during the early postoperative period. For this reason a 500 cc. blood transfusion is routinely given during the operative procedure and another 500 cc. transfusion immediately after the first stage and 1,000 cc. after the second stage.

The second major problem is to secure hemostasis and to deal with the open thorax during the operation and to prevent serious hemothorax, pneumothorax, atelectasis, and pneumonia postoperatively. Grimson[5] has recently stated his position as follows: A closed anesthetic system is employed, with an intratracheal tube used only occasionally. The pleural cavity is deliberately entered through a partial third rib resection and longer tenth rib resection and the chain removed from the stellate ganglion through L-1 and L-2 inclusive, followed by the use of a closed tube suction drainage of the pleural cavity for two or three days.

We also have made use of a closed anesthetic system, usually with an endotracheal tube. Recently we have begun a series without such a tube and the management in the hands of experienced anesthetists has been for the most part satisfactory. One point should be emphasized: this extensive sympathectomy should be carried out only when an anesthetist thoroughly familiar with open chest operative procedures is conducting the anesthesia. Although in our technique the parietal pleura is stripped from the chest wall from the diaphragm to the apex of the thorax, it is usually torn to a greater or lesser extent so that air readily passes into the intrapleural space. The anesthetic agents used have been ether, cyclopropane, and ethylene, and indications and contraindications for them may be found in reports by Phelps and Burdick[11] and Burdick, Phelps, and Peterson.[2]

Hemostasis is not a simple matter in this procedure, and one of the frequent complications has been development of fluid in the chest postoperatively. Grimson[5] has had a similar difficulty by his method of approach. In addition to the clamp and ligature, there are at one's disposal temporary pressure on the venous bleeder against the vertebral column, which is often satisfactory; silver clips, oxycel and other hemostatic absorbable agents, bone wax, and finally electrocautery. We have not used the last mentioned because of the fear of an explosion in the presence of such potentially dangerous anesthetic agents and the open pleura. The most serious difficulty with hemorrhage is presented by an accidental tear of an intercostal artery high in the chest cavity such as the third, fourth, or fifth. When hemostasis has been secured following the removal of the sympathetic chain and suture of the diaphragm, the chest wall is closed around a large rubber catheter placed into the pleural space. Air is completely aspirated, the catheter removed and the skin closed without drainage.

During the entire postoperative period, but particularly during the first 48 hours, careful, repeated, bedside examination of the chest must be made. Signs of fluid and/or atelectasis (usually due to fluid) are promptly checked by a portable x-ray of the chest and aspiration with a large (number 15) needle carried out. In patients with poor cardiac reserve, pleural effusion (usually hemorrhagic) may be of the gravest significance and prompt recognition and treatment may be life-saving.

RESULTS

Although only one aspect of the disease complex is represented in blood pressure readings they are useful as measurable end points. This is especially true of the diastolic pressure. Accordingly, we have summarized the results in 164 patients first by considering only the diastolic pressures, and by arbitrarily dividing our patients into two groups, those who had postoperative diastolic pressure below 110 mm. of mercury and those who had diastolic pressure above that level. From this point of view, those in the latter group were considered to have a less than satisfactory result. Of the 164 patients followed for one year 93 had diastolic pressure of 110 mm. or lower and 71 had diastolic pressure above 110 mm. A somewhat more dramatic response is demonstrated after exercise and is more steadily maintained for a longer period. We have been impressed by the number of patients whose postoperative diastolic blood pressure falls sharply after exercise, even when the resting pressure has been at higher levels. That this does not necessarily represent a good parallel with the effect to be expected from everyday stress and strain was apparent from the fact that frequently such sharp drops were seen in patients whose blood pressure, taken immediately after their walk or taxi ride to an appointment with the physician, was at higher levels. However, this paradoxical effect carries with it implications of benefit in those patients in whom vascular accidents might be anticipated if they were subjected to unaccustomed physical strain. The mechanism of such a drop in pressure may well be the result of peripheral dilatation in the muscle bed, unopposed as in the intact organism, by splanchnic constriction, thus averting the customary summated response of blood pressure elevation, as in the routine preoperative response to exercise. The distribution of diastolic pressure drops, which is indicated in Table 3, demonstrates the significant difference between the resting and exercise results six months following sympathectomy.

RESULTS IN 104 PATIENTS WITH PREOPERATIVE DIASTOLIC PRESSURES ABOVE 150 MM. OF MERCURY

A review of 104 patients whose preoperative diastolic pressures consistently ranged above 150 mm. of mercury is detailed in Table 2. In this group, as might be expected, the immediate hospital mortality is significantly increased. The total number of deaths in the follow-up period at hand is high, but the number of patients followed for more than six months is so small that further conclusions must be deferred. The range of diastolic pressure results is so broad as to preclude critical analysis from the point of view of preoperative prognosis.

That relatively advanced age is not necessarily a contraindication to thoracolumbar sympathectomy is readily appreciated in reviewing the data in Table 3 which represents the operative results in a group of 72 patients from 50 to 59 years of age. The hospital death rate was lower than that of the group as a whole, and the two-year follow-up reveals a large percentage of the patients continuing to maintain a satisfactory diastolic level. Although this group would ordinarily be expected to include a higher percentage of patients with organic vascular changes, intensive clinical study was undertaken to eliminate those with such changes and undoubtedly the results in this group are highly colored by fortunate clinical preoperative evaluation.

TOXEMIA OF PREGNANCY

We do not have at hand data in a sufficiently adequate series to formulate an opinion on the relation of hypertension to the toxemia of pregnancy and the operative results. Of interest, however, are the cases of two young women in their early twenties. One, who had well documented hypertension of undetermined cause, following operation went through a full term of pregnancy with blood pressure entirely normal. The other developed hypertension during a previous pregnancy in the course of mild toxemia, her subsequent blood pressure being in the range of 130 mm. of mercury systolic and 140 mm. diastolic. One year following the day a second stage operation was completed she was delivered of a full term viable infant, having had normal blood pressure throughout her pregnancy. These are, of course, isolated observations, but are noted for their clinical interest.

SUBJECTIVE RESULTS

From the clinical point of view a most important consideration in the evaluation of any therapeutic procedure is the subjective result obtained. Our experience has paralleled that of others, in that we have consistently been impressed by the subjective improvement and the diseappearance of severe and often disabling symptoms irrespective of the effect on the blood pressure. In obtaining these opinions from our patients, in all instances, a nurse-technician has asked them, among other questions, "Has the operation, in your opinion, benefited you?" Many factors enter into such a personal reaction. The patients may have had such a miserable postoperative course that the natural recovery from its severe discomfort leaves them certain that they are now better. Less easy to discount is the almost inevitable relief from pounding headaches and a sense of "relief from tension" not unlike that sensation so often described by patients who have undergone subtotal thyroidectomy for hypertension. Details

TABLE 4.—*Subjective and Objective End Results of Operation**

No. of Patients	Follow-up Period (Mos.)	Subjective Improvement		Marked and Moderate Objective Improvement	
215	6	163	76%	......	....
148	12	123	83%	......	....
76	18	62	81%	......	....
62	24	50	80%	......	....
152	6	......	....	123	81%
69	12	......	....	62	90%
31	18	......	....	28	90%
15	24	......	....	11	73%
8	36	......	....	8	100%

*This evaluation is based on postoperative blood pressure: Electrocardiographic readings, heart x-ray, blood chemistry, urinalysis, and symptomatic improvement.

of the subjective results among 215 patients are tabulated in Table 4 and compared with objective improvement in 152 patients of another group.

THE OVER-ALL PICTURE

As noted in reviewing the cases of patients in the older age group, the final selection of patients for operation is highly colored by what, for lack of a more suitable term, we call clinical judgment. Difficult though this is to define quantitatively, nevertheless the clinical impression of a patient to some extent equals the sum of the effects of the disease processes at work plus the evidence of the force of the patient's particular psychologic and physiologic factors working in opposition to the disease processes. It is a common clinical observation that there are times when the patient looks better than the chart would indicate he should, and vice versa. We feel that most clinicians will agree, especially in the face of equivocal or conflicting laboratory findings, that such an over-all evaluation of the patient must continue to play a significant part in the final decision for or against operation.

Whether complete or nearly complete sympathectomy is preferable to a less extensive operative procedure, has not as yet been determined. In the first two years, we followed the typical Smithwick procedure from T-9 through L-2, but after doing this in approximately 150 cases we gradually extended the procedure. For the past three years the minimal operative procedure has been from T-3 through D-3, and during this time we have also done about 40 total sympathectomies which included the stellate ganglion. The results of some cases (with a complete follow-up) in which the more radical operative procedure was carried out, as compared with results following the lesser procedure, are summarized in Tables 5, 6, and 7. There can be no conclusion that the more radical procedure is preferable until the patients have been observed for a longer follow-up period.

Moreover, as the mortality rate from the more extensive operation is double that from the lesser, this would have to be weighed against end results in forming an opinion as to the relative merits of the two.

130 East 79th Street.

TABLE 5.—*Number of Cases in Which the Postoperative Diastolic Blood Pressure Is Below 100 mm. of Mercury (One Year Follow-up)*

Operation	Total	Number Below 100	Per Cent
T-8 or T-9 through L-2 or L-3	69	18	26
T-3 or T-4 through L-2 or L-3	48	26	54

Table 5 compares the effect of the Smithwick procedure and the extensive sympathectomy on the postoperative diastolic blood pressure. In each patient the resting and post-exercise diastolic blood pressure have been averaged. Only one-fourth of the patients following less extensive operation had diastolic blood pressure levels below 100 mm. of mercury. On the other hand, more than one-half of the patients had diastolic pressures below 100 mm. of mercury following the extensive operation. The vast majority of patients in both groups had preoperative diastolic pressures of 125 mm. of mercury or more.

TABLE 6.—*Number of Cases Obtaining Smithwick Groups I and II Diastolic Blood Pressure Result (One Year Follow-up)*

Operation	Total	Number of Groups 1 and 2	Per Cent
T-8 or T-9 through L-2 or L-3	69	33	48
T-3 or T-4 through L-2 or L-3	48	36	75

Table 6 shows the relative percentages of Group I and Group II Smithwick diastolic blood presure results. A Group I result represents a fall of 30 points or more from the preoperative diastolic pressure and a Group II result represents a fall of 20 to 29 points. Again it is clear that the extensive operation is more effective in lowering the blood pressure.

TABLE 7.—*In-Hospital Mortality Rate in 100 Consecutive Cases in Each Group*

Operation	Number of Cases	Deaths	Per Cent
T-8 or T-9 through L-2 or L-3	100	3	3
T-3 or T-4 through L-2 or L-3	100	6	6

Finally in Table 7 the number of deaths in the hospital in 100 consecutive cases in each group are compared. In both of these series the operations were done before the establishment of a set of rules which have proved helpful in the elimination of the majority of bad-risk patients. If the rules had been employed in the above two series the mortality rates would have been halved. We are fully aware that experienced and sound clinical judgment must go hand in hand with the practical application of the rules.

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Otitis Externa

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SUMMARY

Otitis externa is a widespread condition which may occur in many different forms. Allergic reactions, bacteria, pathologic changes secondary to seborrheic dermatitis, and fungi, singly or in association with each other, are among the causative factors considered.

In the treatment of this condition, the diversity of causative factors which may be present must be recognized and evaluated; after one factor has been eliminated, another often remains to be conquered. The apparent confusion of reports regarding etiology and treatment is in fact due to confusion regarding the fundamental nature of the condition. Good results usually can be obtained by careful evaluation of the factors in each case and adaptation of treatment to the circumstances.

OTITIS externa is the common name given to inflammatory conditions of the external ear and external auditory canal. Incidence of the disease is high in otological practice. Dermatologists have contributed a great deal to knowledge of the condition, and in treatment of it the two specialties overlap. As there may be multiple etiological factors present, treatment should be directed to the eradication of the basic as well as secondary or superimposed infection.

In the adult, the external auditory canal averages 1¼ inches in length and is directed inward and forward. The inner one-third of this canal is supported by bone and the outer two-thirds by cartilage. The skin which lines the canal covers also the outer surface of the tympanic membrane. It is thick in the cartilaginous portion and contains hair follicles and sebaceous glands, the latter extending for some distance along the posterior and superior walls of the bony portion of the canal.

External otitis is often a painful condition. Authorities differ considerably on the subject of the nerve supply of the external ear. Eggston and Wolff[4] state that the confusion is due to three factors: (1) the anatomic variation in different individuals, (2) the fact that data have been collected from clinical observation of cases of herpes zoster, referred pain, and similar affections and not from anatomic dissection, and (3) the fact that the areas supplied by the various nerves overlap each other considerably. Sensory innervation is supplied by the auriculotemporal nerve of the mandibular branch of the trigeminal nerve, the auricular branch of the vagus nerve, and the great auricular nerve from the second and third cervical nerves.

The relative incidence of external otitis in men and women has not been determined. The recent war has given a distorted picture in this respect because of the large groups of men transplanted from their normal environment to hot, moist climates where external otitis is very common and often severe. No age group is exempt but the preponderance of cases is found among young adults.

ETIOLOGY

Many factors play a part in inflammatory reactions of the external ear. Allergic reactions, bacterial infection, pathologic changes secondary to seborrheic dermatitis, and fungous growths have been named as the usual causes. Other possible causes such as extremes of temperature, either heat or cold, radiant energy effects which may cause profound tissue changes, and chemical irritations not associated with hypersensitiveness or allergy, will not be included in this discussion.

Allergic external otitis is due to exposure to an allergen to which the individual is hypersensitive. It may be acute or chronic. The acute stage is usually manifested by an exudative type of eczematoid dermatitis which may become chronic with thickening and desquamation of the skin. Cosmetics may produce these reactions; fingernail polish has been reported as a frequent offender, as have scalp lotions and perfumes. Sulfonamide and penicillin preparations, as well as many preparations used routinely in otologic practice, should always be regarded as possible causes of this condition.

External ear infections may be classified as pyogenic, non-pyogenic, and mycotic.[5] Impetigo contagiosa not infrequently invades the external auditory canals of children and may be found in adults. The lesions are usually typical and have been attributed to the action of streptococci and staphylococci. A deeper invasion of the skin produces pyogenic dermatitis which may affect the underlying cartilage. These reactions are occasionally severe.

A circumscribed inflammatory reaction may develop with localized abscess. The lesions may be single or multiple and have a pronounced tendency to recur. Severe pain in such cases is due to localized

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swelling in tissues in which there is little room for expansion; well-developed furunculosis causes a great deal of distress. It is occasionally difficult to differentiate these reactions from those of acute otitis media. They may even be associated with disease of the middle ear as secondary skin lesions which develop as the result of contamination by infected secretions from the middle ear cavity.

Acute cellulitis of the external ear may follow any break in tissue which permits infection to gain entrance; a break in the skin of the ear canal caused by the common practice of scratching or by an unnoticed insect bite frequently provides a portal of entry.

Erysipeloid reactions and true erysipelas of this area may be encountered. These acute reactions are usually demarcated and present the usual picture of acute lymphangitis.

In inflammatory reactions of the external ear, in which bacterial invasion of the tissues has occurred, the factors are many and diverse. Williams, Montgomery, and Powell[13] found by special culture methods that streptococci were frequently present in otitis externa and expressed the belief that these organisms were of etiologic significance. Beach and Hamilton[1] reported that in 65 of 69 cases observed on a South Pacific island the infection was due to Pseudomonas aeruginosa; of the remaining four "one showed a fungous growth and three a mixed type of infection composed of streptococci, staphylococci, and diphtheroids." Senturia and Broh-Kahn[5] expressed the opinion that "the high degree of correlation between the presence of Pseudomonas organisms in the ear canal and the existence of certain types of external otitis suggests some relationship between these organisms and the disease." They further stated that this organism can almost always be isolated from the ear canals of patients with external otitis and not from the ears of normal individuals. P. aeruginosa is a particularly frequent water contaminant in the tropics; it is found also, although less often, in temperate climates.

Seborrhea is a frequent influencing factor in reactions in the external auditory canal. The dictionary defines seborrhea as a "chronic disease of the sebaceous glands marked by the occurrence of an excessive discharge of sebum from the glands." It does not occur until the age of puberty. According to Becker and Obermayer,[2] Unna believed moroccus was the causative agent in seborrhea, whereas Moore, Kyle, and Engman[2] have named Pityrosporum ovale as the infecting organism. The cause of seborrheic dermatitis is not known. Most investigators agree that because of constitutional peculiarities, the skin glands of some individuals provide a suitable medium for the growth of saprophytes or secondary invaders. Many of the cases of external otitis encountered in office practice in temperate climates are due to seborrheic dermatitis complicated by local cellulitis resulting from bacterial invasion of the tissue surrounding the sebaceous glands. This process may begin as an infection of non-resistant sebaceous glands. The organisms involved in the secondary reaction are likely to be streptococci, staphylococci, and diphtheroids. Maceration of epithelium by water or perspiration is a common predisposing factor and in some of these cases the superficial epithelium harbors a parasitic growth of fungus.

Seborrheic dermatitis may be confused occasionally with psoriasis, one of the most common of all dermatoses. Psoriasis often affects the scalp and may extend down to the postauricular area. The differential diagnosis is made by the absence of similar lesions at sites of predilection of psoriasis, the nature of the lesion and of the scales, which in seborrheic dermatitis are thinner and less adherent than in psoriasis, and by the absence, upon removal of scale, of minute bleeding points which are present in psoriasis.

OTOMYCOSIS

Otitis externa in which the causative agents are thought to be molds is that type of inflammatory disease of the external ear referred to as otomycosis. Three types of molds may be encountered in such cases: (1) budding forms, (2) filamentous forms, and (3) higher bacterial forms. Higher bacterial forms of molds possess properties of both bacteria and molds. Classification of them is confused and there is a synonymity of names. "Bergey's classification (1934) contains 70 species under the genus Actinomyces."[7] They will not be considered here except to state that the primary lesions of actinomycosis may occur on the external ear or in the external auditory canal and that these structures may be invaded by extension from a nearby focus.

Some otologists are convinced that the molds found in external canal lesions are definite pathogens and describe the condition as being caused by the molds found to be present. Whalen[12] stated that species of Monilia, Aspergillus, Penicillium, and Achorion have been found. Many believe that if molds are to be considered pathogenic it must be with the qualification that the site and conditions are predisposing factors. Forms of budding and filamentous fungi may be cultured from the surface of normal skin and the question arises whether they can be named as the cause of the disease under discussion. Positive demonstration of molds as the primary invaders in cases of otitis externa is extremely difficult. McBurney and Searcy[9] stated that "the relationship of these [molds] as primary invaders has not been established since animal inoculations with the isolated fungi have almost invariably yielded negative results." Chisolm and Sutton[3] thought that "in the ear the fungus is probably never a primary invader but it may persist after the primary condition has disappeared or become masked by it." Lewis and Hopper[8] report that auto-inoculation experiments with Aspergillus were attempted on several occasions but were not successful. The presence of fungi in infected auditory canals can be demonstrated in fewer than a majority of cases. Simon[11] treated 90 male patients for external otitis in a tropical climate. In only 21 per cent of these cases did cultures reveal the presence of a fungus. The author of this presentation studied material from infected auditory canals in 100 consecutive cases among naval personnel in the hot, moist climate of the Philippine Islands. By using the method of Whalen[12] of examining a smear treated with 2 per cent sodium sulfite with methylene blue added, molds were identified in only 19 cases. Culture and fermentation studies were not attempted. Although it is possible that in some of the cases fungi were the primary invaders and were later crowded out by bacteria, the fact that many of the patients in whom the fungi were not demonstrated were seen during the early and acute stages of the disease rather belies this possibility. It would appear that in most instances factors other than fungi were responsible for the condition, and that molds when present represented a parasitic growth. It is not to be doubted that actively growing fungus contributes to the infectious process and is responsible for some of the clinical manifestations. Under conditions favorable to such growth the vegetative portion of a fungus increases whereas under adverse conditions there is a tendency toward production of spore forms which are resistant to all forms of treatment. Invasion of the epithelium causes itching and discomfort. The resulting reactions may be mild or severe; exfoliation and denudation may be followed by ulceration and eczematoid dermatitis.

TREATMENT

Treatment of otitis externa must be directed toward the fundamental causative factor and must be carefully adapted to the severity of the dermatitis present. The treatment of external ear lesions caused by allergic reaction is primarily a problem of determining the irritant or allergen to which the patient is sensitive and eliminating this factor. Impetigo contagiosa is highly infectious and precautions must be taken against extension to other persons. Thorough cleansing with removal of crusts is essential; antibiotic preparations applied to a clean base are effective. Pyogenic dermatitis is treated as impetigo is treated, with thorough cleansing; the spreading cellulitis is treated as such with wet dressings; sulfonamides or penicillin may be helpful also. Furunculosis requires medication for relief of pain; if the infection is severe such relief will be inadequate at best. For the localized reaction and in the acute stage of diffuse swelling from cellulitis, loose packing and wet dressings with aluminum acetate have proven most satisfactory in the author's experience. Full strength or one-half strength Burow's solution may be used. Antibiotics often produce spectacular results if adequate blood levels are obtained and maintained. Surgical intervention is to be avoided if possible. Erysipelas responds to antibiotic therapy and to specific sera.

The large remaining groups of cases of external otitis present a complicated therapeutic problem. The number and variety of suggested remedies leads to the suspicion that none is satisfactory. The suggested remedies are perhaps numerous because the causative factors are varied and the treatment must be selective to be effective. Seborrheic dermatitis, bacterial cellulitis, and fungous dermatitis may be present in varying degree. Although seborrheic dermatitis may be the fundamental factor in many cases, the other factors must also be evaluated. Pseudomonas organisms respond readily to substances containing the acetate radical. Acetic acid, 2 per cent, is helpful, as is cresatin (metacresyl acetate). Gill[5] considers the latter preparation a potent fungicide, especially when reinforced by the addition of thymol. Pseudomonas aeruginosa is sensitive also to the action of streptomycin. Senturia and Broh-Kahn[5] reported success with an ointment containing 5 mg. of streptomycin per gram of ointment base, in cases which showed a predominance of these organisms. Hayes and Hall[6] consider a new compound, dibromsalicylaldehyde, to be especially effective against Gram-negative organisms including Ps. aeruginosa and also against fungi. Its use is recommended in solution or powdered form. Favorable response to the topical and systemic use of sulfonamide preparations is occasionally obtained. The topical application of penicillin preparations has been reported to be effective when Gram-positive organisms predominate. The author has not found this method of much value. The possibility of complicating the picture with allergic reaction to antibiotics, when these are used, must be borne in mind. Dyes have been used but rarely with success.

After the acute inflammatory reaction subsides the seborrheic dermatitis, if present, remains to be treated. Sulfur preparations have proven of value in these cases. Ichthyol has been used, and precipitated sulfur may be applied in an ointment. Ammoniated mercury and salicylic acid have been found efficacious. Some dermatologists stress the importance of a greaseless base in ointments for this use. The avoidance of moisture in the area is important and general hygienic measures should be instituted. Energetic treatment of the surrounding scalp is essential, as this area often acts as a focus of infection. Vitamin therapy cannot be expected to produce results unless a true deficiency exists.

Roentgen therapy is widely regarded as a valuable form of treatment for many dermatoses. The element of danger in its application limits its use to those who have had special training in it. Roentgen rays are not appreciably bactericidal but they are supposed to induce increased antibacterial activity of the tissues by disintegrating leukocytes and releasing antibacterial substances. Furunculosis, erysipelas and impetigo have been treated in this manner. Sebaceous glands are sensitive to roentgen rays and the margin of safety is wide in the treatment of hyperactivity of these glands. Excessive activity of the glands may be curbed by appropriate irradiation before surrounding cutaneous tissues are affected. Any beneficial result is probably due to control of the underlying seborrhea.

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Discussion by Frederick G. Novy, Jr., M.D., *Oakland*

Otitis externa is a vexing problem to both the otologist and the dermatologist. Dr. Rees has emphasized that the causes may be multiple and that many agents can produce dermatitis of the external auditory canal.

The term fungous infection of the ears is a misnomer. This has been brought out by Dr. Rees in his paper and has been confirmed by the investigations in the tropics during the war by Syverton, Hess, and Krafchuk (Arch. Otolaryng., 43:213, March 1946). These authors and others, such as Salvin and M. L. Lewis (External otitis with additional studies on the genus Pseudomonas, J. Bacteriol. 51:495-506, April, 1946), found in many cases of infection of the external auditory canal that the offending organism was usually Pseudomonas aeruginosa (bacillus pyocyaneus). In both of these series of cases, when fungi were isolated from the external auditory canal, they were of the type which ordinarily are considered non-pathogenic. The high incidence of pyocyaneus infection can well explain why ordinary methods of treatment with the usual antiseptic agents have not been satisfactory since pyocyaneus is notoriously resistant to ordinary antiseptic solutions.

It is my feeling that the chronic recurring external otitis is nearly always on the basis of a seborrheic dermatitis involving the scalp, ears and occasionally other areas. At times superimposed upon this seborrheic dermatitis there is a secondary infection explaining the clinical exacerbation. For this reason the scalp should always be treated for the seborrheic dermatitis and after the acute exacerbation subsides the external auditory canal should also be treated on this basis. There are some investigators who feel that seborrheic dermatitis is due to a Vitamin B deficiency. Certainly it is true that in some of the chronic cases the patients apparently show improvement with large doses of Vitamin B and, in addition, injections of crude liver extract.

In regard to treatment in the past, weak solutions of acetic acid and liquor aluminum acetate (Burow's solution) have been fairly satisfactory in the chronic cases. Recently there have been enthusiastic reports on the use of streptomycin by Calloway (Pseudomonas aeruginosa infection of the ear treated with streptomycin, Arch. Dermat. & Syph. 55:257, Feb., 1947). He used a solution containing 2,500 units per cc. as a wet dressing. Others have also reported favorably on this drug.

A word of warning should be raised concerning the use of streptomycin locally because there have been several reports of a severe localized dermatitis occurring in the nursing personnel making up solutions with this drug. Recently I had the opportunity of talking with the medical department of a large Veterans Hospital devoted to the care of tuberculous patients where investigative work with streptomycin was being done. Over half of the nurses handling this drug had severe dermatitis of the hands. I feel that this may be a consideration in the use of streptomycin locally in the treatment of various pyodermas of the skin.

Among the newer sulfa compounds that have been developed there is one known as sulfamylon which has proven *in vitro* to be highly effective against bacillus pyocyaneus. This drug may be the answer in handling severe, chronic cases of otitis externa which are apparently due to this organism.

Because of the complexity of etiologic factors in otitis externa, Dr. Rees' admonition to appraise the factors in each case carefully and adapt the treatment to the situation should be heeded.

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Observations on Difficulties Encountered in the Serological Diagnosis of Brucellosis and Q Fever

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WITH the introduction of the complement-fixation technique in the routine serological diagnosis of Q fever as originally developed by Bengtson (1941), difficulties have arisen regarding the interpretation of the results. The problem becomes particularly evident when the clinical and epidemiological history strongly incriminates exposure of the patients to meat and milk producing animals which may be infected not only with Coxiella, but likewise with Brucella.

In the course of serological studies on persons exposed by means of slaughterhouses or dairy products in California, it was observed that serological reactions of several patients with symptoms and signs indicative of brucellosis, sometimes including strongly positive agglutination and complement-fixation reactions for Brucella, were also positive in the presence of Coxiella antigens. The records of a few such observations are summarized in Table 1.

In Case 1 (Table 1), the presence of Brucella suis infection was proved through cultures and the rise of antibodies for this organism. In addition, however, serum in the same case gave a positive complement-fixation reaction with Q fever antigen (Cox-Lederle antigen, American strain). Whether this reaction expresses the coexistence of Q fever and brucellosis or whether the low complement-fixation titer indicates a response to an antigenic fraction common to both Brucella and Coxiella can only be answered through antigen analysis of the Coxiella.

TABLE 1.—*Serologic Results Illustrating Diagnostic Difficulties.*

		Brucella Diagnostic Tests			*Q Fever*		
Case	*Date*	*Agglutination*	*Complement-Fixation*	*Phagocytic Index*	*Complement-Fixation*	*Diagnosis**	*Exposure*
1.	3-18-48	1:1280++++	1:256++++	7.72	1:16++++	Brucellosis (Br. suis. blood culture)	Slaughterhouse, 6 months
	4-2-48	1:5120++++	1:2048++++		1:8++++		
					1:16+++		
					a.c. 1:8+		
2.	6-28-48	1:640++++	1:640++++	0.36	0	Brucellosis	Butcher, slaughterhouse, 9 months
	8-18-48	1:2560++++	1:64++++	8.44	1:16++++		
3.	7-11-47	0	1:256++++		1:32++++	(Brucellosis) Q fever	Butcher, slaughterhouse, over 2 yrs.
	3-30-48	0	1:4++++	9.7	1:64++++		
	5-4-48	0	1:4++++	13.36	1:256++++		
4.	9-9-48	0	1:64++++		1:64++++	Q fever	Raw milk mixer, milk plant, over 10 years
	9-16-48	0	1:32++++		1:64++++		
	10-13-48	0	1:16++++		1:64++++		
5.	11-26-47†	0				(Brucellosis) Q fever	Slaughterhouse contact, 3 to 4 yrs.
	12-14-47	1:640++++	1:256++++		1:64++++		
	12-31-47	1:640++++	1:64++++		No serum		
	4-27-48	0	0		1:256++++		
	5-13-48	0	0		1:256++++		
6.	5-17-48	1:640++++	1:256++++	2.0	1:256++++	Q fever	Slaughterhouse, 13 years
	5-27-48	1:40++++	1:256++++		1:1024++++		
	6-24-48	0	1:32++	7.24	1:2048++++		
7.	5-5-48	1:640++++	1:256++++		1:16++++	(Brucellosis) (Virus pneumonia) Q fever	Raw milk
	5-28-48	1:640++++	No serum		1:64++++		
	6-4-48	0	0		1:256++++		
8.	6-15-48	1:1280++++	1:64++++		1:256++++	Q fever	Dairy cattle ranch, 27 yrs.
	6-24-48	1:64++++	0		1:256++++		
	7-12-48	0	0		1:256++++		
					1:512++		
	10-21-48	0	0		1:64++++		

*If the diagnosis was changed, the first is given in parentheses.
†Serologic tests were not made in Hooper Foundation laboratories.

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In the future in cases in which this question arises, it will of course be necessary to make every possible effort to demonstrate the presence of Coxiella.

In Case 3, in which the presence of chronic brucellosis was indicated by complement-fixation reactions with Brucella in 1947, the patient continued to have clinical relapses although there was no serological or other evidence to support the diagnosis of chronic brucellosis. When serum from this patient was finally tested following a pronounced relapse in 1948, a progressive rise in titer definitely indicated a Coxiella infection. Thus, the diagnosis was changed to Q fever. Again, an inoculation test for Coxiella would have been valuable.

A similar history concerning the patient in Case 5 emphasizes the necessity for testing the sera of slaughterhouse employees over a period of several months before a diagnosis is made. In this case a diagnosis of brucellosis was made, despite the fact that repeated blood cultures were negative and the agglutination and complement-fixation titer for Brucella gradually declined while, on the other hand, the titer for Coxiella rose. This reversal is an example of an anamnesic reaction; that is, Brucella antibodies increase or reappear in the presence of the nonspecific antigen. The patient in this case had previously been infected with Brucella and the antibody-producing center was stimulated through the infection with Coxiella. The serological findings and histories in Cases 6, 7 and 8 furnish additional evidence in support of the interpretation offered for the findings in Case 5.

These observations are merely presented as additional evidence of the well-known fact that a diversity of antigens stimulate the appearance of Brucella antibodies. On the other hand, Brucella antigens may stimulate, in occupational groups exposed to livestock, the appearance of Q fever antibodies. There is no need to emphasize that in view of these findings the serological diagnosis of undulant or Q fever may be very difficult and that repeated blood cultures for Brucella and now inoculation of guinea pigs for the demonstration of the Coxiella are absolutely essential.

Detailed investigations are indeed indicated before far-reaching conclusions are drawn from epidemiological surveys based on serological tests.

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The Prescription for Light Work for the Partially Disabled Employee

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SUMMARY

A prescription of "light work" for the industrially employed patient who is convalescent from injury or illness often is difficult to carry out and may do more harm than good to both employer and employee. Criteria developed from the observations of a physician engaged in an industrial establishment may be helpful to the physician in private practice who is called upon to decide when a patient may safely return to work and how strenuous or exacting the work may be.

MOST physicians in private practice have occasion at one time or another to present to an industrially employed patient who has been incapacitated by injury or illness a statement to take to his employer to the effect that "Employee is able to return to light work." Those physicians who have been engaged either full-time or part-time within an industry are likely to be familiar with the difficulties of compounding this prescription and with the various combinations of circumstances which make light work possible or desirable.

A review of the pertinent experiences of the physician in industrial practice may be helpful to the "outside" physician, for from them it is possible to develop criteria as a basis for judging the advisability of the "light work" prescription.

So far as the physician in private practice and his patient are concerned, the problem may appear quite simple. The patient is convalescent and willing, possibly even anxious, to work. But he describes his normal work, and it appears obvious that he is not improved to the point where he should attempt to return to it. It demands, in muscular activity, efforts which he cannot yet produce safely or efficiently. Yet, in the terms by which disabilities ordinarily are rated, he has only a small degree of limitation and if there is work which he can perform within his capacity, a simple statement to this effect seems quite appropriate and reasonable.

It is when we approach the job to which he is to be assigned that we find a number of variables. It may be well at this point to reexamine the accuracy of the belief that while the man is actually disabled for his own particular job, he would not be disabled for another. Has it ever been recorded that the easiest work a man can do is his own job? His muscular and his mental patterns have been developed to fit that job, and even though it might appear to an observer to be more difficult than others, for the man accustomed to it, it is much easier than a new, even if lighter, job would be.

If it is established that the patient cannot do his own job, the possibility of making slight alterations in his regular work by relieving him of certain of the heaviest or most exacting motions in connection with it may be explored at first. Assume, however, for the purpose of this discussion, that the patient's own job, even if modified, still remains incompatible with either his comfort or his recuperative progress, and that he must be considered disabled for it.

The alternative most commonly resorted to is assignment of the employee to another existing job, in which the physical demands are compatible with the employee's limited capacity. If this job is productive, if it calls for an effort approximately equal to the effort called from this man on his own job, and if he can deliver approximately a day's production with a feeling of adequacy, the assignment is likely to prove satisfactory and the situation quite healthy. (Any difference in pay rate that may exist between the two jobs is a matter of plant policy and the situation is likely to be covered by a labor union contract.)

Another alternative is to assign the employee to a synthetic job, and such jobs are likely to vary greatly in their productivity. Occasionally a collection of odds and ends may be assigned to an individual so that he is usefully employed for his eight hours, but it is more than likely that he will be less usefully employed than on his normal job, and it frequently happens that his actual usefulness is close to nil. It is in this situation that the undesirable results of returning a convalescent to work are most clearly demonstrated.

Let us first consider an example in which the practice is completely satisfactory. John Doe, 32 years of age, a laborer employed seven years, an emotionally stable individual who is recognized as a good, steady employee, fractures a wrist in the course of his employment. It has been immobilized in plaster, and the prognosis is offered that he can return to his regular work, which is quite heavy, in a matter of eight weeks.

If John is kept out until he is well, he will lose considerable income, due to the difference between

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his compensation and his wages, and the employer is sympathetically inclined on this score. Perhaps, also, a safety campaign is about to start or is at its height, or has just been completed in the plant, and there is the record of lost man-days to consider. Fifty-six days on the accident record are worth saving, and so are the compensation costs which will not only be a current expense but also will be reflected in future insurance premiums due to the increased experience rate. There is some work which John could do which is not too exacting, and, what with one good arm and the other protected by a cast, and a certain amount of indulgence on the part of his supervisor and his fellow workers, he can put in the time on this work. On the face of it, everyone will gain: John will take home his full wages, will accomplish some work, compensation costs will be reduced, and the accident record will benefit. It may well be that these benefits will actually be realized and at the end of eight weeks John will be back at his old job. The plan may have been so successful that this practice will be adopted as future policy in similar cases.

Sooner or later, however, we will find the following pattern developing in the case of one of our John Does:

John Doe II will start out quite happily. His supervisor will be friendly and indulgent, and those around him will willingly help him. John II, whose education is minimal, has also been a very good worker when he was at his own job, and was apparently well adjusted to the routine heavy work. Now, for the first time, he is in a position where he cannot hold up his end and is actually encouraged not to try.

During the course of the next few weeks, he will accommodate himself to this comparative comfort, and about the time he is really settling down to enjoy it, he will sense a desire on the part of the supervisors and those about him that he begin again to hold up his end. The incentive to admit physical improvement will be lacking, because John II will be enjoying what Freud has described as the "advantages of an illness." John's physician will begin to sense an anxiety on his part over residual pain or other symptoms, which will not seem compatible with original expectations of his progress.

Of course, he will finally return to his old job, as there is a point beyond which he will not be able to extend his partial disability—but he will have developed feelings of hostility and resentment toward those who (he will feel) have crowded him back to work despite the residual pain; and he will, subconsciously at least, have learned a technique to escape from hard, routine or unpleasant work. If he has a potentially neurotic make-up, he will have a future punctuated by injuries or ailments which will make him an unhappy placement problem indefinitely.

Actually, no one will have gained in this situation —least of all John II himself. Had he been kept on the disability list and treated as one who had a temporarily total disability, he would have made a complete recovery within the estimated period of time and would have had the incentive to return to work, as cured, as soon as possible.

In reality, the efforts to assist John II to escape the financial effects of a disabling injury have resulted in a new psychic injury to him. All that has been accomplished is the concealment of the actual cost of a compensable injury and its replacement with a buried production cost and a living personality problem. Yet many employers will fill a physician's prescription for light work, feeling that they are generous in so doing.

Possibly the case of John Doe II has been oversimplified, yet he or his counterpart has been seen in enough variations to warrant skepticism as to the advisability of prescribing special work for patients who are partially and temporarily disabled. As a general rule, unless a man can return to his own job, all the possibilities of the situation should be scrutinized very carefully before he is assigned to "easy work," or to what one worker colorfully described as a "fool-around job."

Somewhat the same principles apply to the early return to work when maximum improvement has not been achieved. There are disabilities of such nature—the marked disability caused by a foreign body in the cornea, for instance—that the length of disability can be accurately described in terms of minutes or hours. Few disabilities, however, can be so definitely estimated in terms of time. There is a twilight zone of convalescence in which it is impossible to state positively that the patient was disabled until exactly a certain date and was completely well from that date on. Therefore in the course of time the author has grown more and more willing to err on the side of prolonging disability time rather than shortening it.

This has been particularly true in cases of injury to the back. The single episode of the strained back is not the cause of the greatest anxiety or expense. It is the patients with recurrent and chronic back ailments who are the trial. In the author's experience increasing insistence that all residual pain must have disappeared before an employee is returned to heavy work has resulted in a considerable diminution of total lost time, rather than an increase, through a reduction in the number of recurrences.

PERMANENT PARTIAL DISABILITY

In the case of the permanent partial disability, of course, the situation is entirely different. Maximum improvement has been reached and the patient is still partially disabled. A return to work in this case, even though the work be entirely unproductive, may be a rehabilitation procedure of tremendous value. Lack of productivity over a period of time may be relatively insignificant compared with the value of rehabilitating the employee.

Similarly, in special cases, some degree of rehabilitation on the job is desirable, even though no permanent disability is expected. A patient who has been institutionalized for a long time as a result of a chronic disease, and who has been surrounded by the ill, and who has been under a regimen of proscriptions, may be in great need of an on-the-job rehabilitation and an opportunity to spend a period of time adjusting to the return to the competitive life of healthy individuals. However, in most such cases it is probably better that a program of convalescence planned outside the plant be carried on until the patient steps over to work rather than returning in a state of asthenia and stepping up to it.

Employees with allergic reactions, particularly in the respiratory system or skin, to any agents with which they work or which surround them in their job pose a special problem. In such cases a change of work, not necessarily to easy work, but an entire change of working environment, is required. Not only may such a solution be difficult to work out, but in many cases it may not be lasting.

CRITERIA FOR RETURN TO LIGHT WORK

1. In considering an employee to be disabled for his own job, but able to do easier work, due allowance must be made for the fact that he is mentally and muscularly "in training" for his own job; and new work to which he is not accustomed, even though it is apparently lighter, may not actually be easier for him.

2. Temporary modifications of his own job to meet temporary disability should be considered before placing him on a new job.

3. New temporary jobs should, ideally, be fairly productive and call for sufficient effort to provide the employee with a sense of adequacy.

4. Synthetic jobs, if unproductive and calling for a minimum of effort, may retard the normal incentive for recovery and encourage a previously adequate individual to exploit the "advantage of an illness." The light work assignment should not be of such nature that the return to regular work will arouse hostility and resentment in the employee.

5. Return to either regular jobs or new lighter jobs should be delayed, rather than hastened, if early return may invite recurrences. In cases of doubt, the doubt should be resolved in favor of late rather than early return.

6. Where rehabilitation is required, productivity may be an entirely secondary consideration, and a synthetic non-productive job considered as a useful therapeutic measure.

7. Convalescence off-the-job should be encouraged until return to work involves a minor increase of effort rather than a maximum physical strain.

RECOMMENDATIONS

Is there a practical use which physicians not fully familiar with work conditions in industry might make of these criteria? When a physician gives an employee a statement that he is ready for "light work," he does so in the expectation that it will be presented to someone in authority at the place of work. It would be more effective to give him a note saying, "Would like to discuss the possibility of light work for this patient. Would you be good enough to call me on the telephone?" This simple practice will result in a useful exchange of information between the physician and the plant nurse or some lay authority at the plant, with the result that in many cases the employee will be better protected. A decision whether to give him light work, an existing job or a synthetic one, return him to his old job, or have him stay on disability status until greater improvement occurs, is a very important one so far as the patient is concerned, and a decision made on lack of adequate information may be to his disadvantage. A description of his job or of the alternate jobs open to him, supplied by the employer, may alter the physician's recommendation. The information the physician may get about plant conditions and policies in a few minutes of conversation with the employer will be useful in future dealings with other patients employed at the same plant.

California Cancer Commission Studies*
Chapter XXVII

Cancer of the Cervix

Herbert F. Traut, M.D., *San Francisco*

EVERY year in the United States approximately 17,000 women die of cancer of the cervix. In each case the disease went through an early stage when a cure could have been effected. It is estimated that approximately one out of every hundred women between the ages of 35 and 75 years has incipient or active carcinoma of the uterus.

Carcinoma of the cervix seems to have been co-existent with the human race, for the oldest medical writings refer to it in unmistakable terms. It is more common in married women and most common in those who have given birth to offspring; however, it is also seen in virgins and in nulligravida. There are racial proclivities, for the disease is seldom seen in women of Jewish ancestry, more commonly in Negroes, and is most common of all in Nordic and Oriental peoples.

ETIOLOGY

The cause of cervical cancer is unknown. Many theories have been advanced. The idea that misplaced groups of cells or embryonal rests are responsible was taught by Cohnheim. Chronic irritation, lacerations and erosions of the cervix have been thought to be underlying factors. Recently endocrine forces have been supposed to play a role, and still more recently viruses have been suspected and thought to be the only agent which could explain all the known facts.

The simple truth is that we do not know, and hence must treat the disease empirically until the causative factors can be revealed and a more logical mode of attack formulated than is possible at the present time.

PATHOLOGY

Cervical cancer is of three different cell types. The commonest type develops in the squamous epithelium of the portio of the cervix and usually at the junction of this epithelium with that of the mucous cells of the endocervical canal, from which point it rapidly spreads to other portions of the cervix. This type of cervical carcinoma characteristically is suggestive of the squamous epithelial cell. A less common form, of glandular nature, arises primarily in the mucosa of the endocervical canal or the glands which empty into it. It is therefore known as adenocarcinoma of the cervix, and the epithelium is suggestive of the epithelium which lines the cervical glands. A third type arises at the isthmus of the uterus, that is, at the juncture of the cervix and fundus. This rare form is also glandular in pattern but also contains squamous cells and is therefore known as adenoacanthoma. This is usually considered as a rare type of adenocarcinoma of the fundus, but undoubtedly it can arise from the region of the internal cervical os and for this reason mention of it seems desirable. The squamous type of cervical carcinoma and the glandular type of adenocarcinoma can be further classified, the classifications ranging from full differentiation of the mature cells to the less differentiated or immature or embryonic type of cell. With the squamous variety they are classified as follows:

Grade I—Representing full maturation with keratinization.

Grade II—Representing only a medium degree of differentiation.

Grade III—Representing embryonic or undifferentiated cells.

The glandular type or adenocarcinoma may be subdivided in a similar manner according to the microscopic appearance of the cells.

Grade I—Adenoma malignum—A well differentiated overgrowth of glands.

Grade II—Adenocarcinoma—Less well differentiated and with papillary tendencies.

Grade III—Adenocarcinoma—Slight gland pattern and cells tending to grow in sheet formation or in columns.

These microscopic gradings are of considerable importance in the treatment of patients. For instance, it is recognized that the Grade I type of squamous carcinoma grows rather slowly and may be less sensitive to radiation therapy as compared with a Grade III type of growth. Similarly the Grade I adenocarcinoma is much more benign and more slowly progressive than the less differentiated types.

Little need be said regarding the adenocanthomatous type because of its rarity. Fortunately for the patient harboring this type of growth, it extends slowly while still contained within the uterine musculature; however, once these barriers are traversed, this type of growth spreads widely and rapidly, metastasizing in all directions.

Of even greater importance when it comes to the evaluation of proper treatment and the probable prognosis in a given case is the extent to which the lesion has spread. The most widely accepted method of "staging" the extent of the growth is that adopted by the League of Nations in 1938. The stages are defined as follows:

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*Organized by the Editorial Committee of the California Cancer Commission.

Stage I—The cancer is strictly confined to the cervix.

Stage II—The cancer has spread beyond the cervix and has infiltrated the parametrium on one or both sides but has not invaded the pelvic wall; or, it has begun to extend downward along the vaginal wall but it has not involved its lower third; or, it has spread to the body of the uterus.

Stage III—The cancer has extended beyond the cervix and his infiltrated the parametrium to one or both pelvic walls; or, it has involved the lower third of the vagina; or, isolated metastases are palpable on the pelvic wall irrespective of the extent of the primary cervical growth.

Stage IV—The cancer has involved the bladder as determined by cystoscopic examination or by the presence of a vesico-vaginal fistula; or, the cancer involves the rectum; or, the cancer has spread outside the true pelvis, i.e., below the vaginal inlet or above the pelvic brim.

CLINICAL CHARACTERISTICS

The symptomatology of carcinoma of the cervix in its early stages is by no means uniform. Not infrequently a suspicious looking area on the cervix which has been completely asymptomatic will prove to be carcinomatous when biopsied. More commonly a history of abnormal vaginal discharge or abnormal bleeding may be obtained. The discharge is apt to be watery in character rather than purulent. The abnormal bleeding may be nothing more than slight spotting after intercourse or a small amount of intermenstrual bleeding. If the woman is past the menopause, it may be represented by slight postmenopausal spotting. The amount of bleeding is usually very slight in the early stages. Unfortunately, pain is not an early symptom and it may be entirely absent until the late stages of the disease. Obviously the findings at the time of a careful pelvic examination are of the greatest importance. Such an examination includes not only a bimanual examination but visualization of the cervix, with a proper speculum and a good light.

The picture of advanced cancer of the cervix is only too familiar to all physicians. The everting or cauliflower growth which bleeds easily when touched, or the inverting type with ulcerative crater formation, either of which may be, and usually is, associated with extensive invasion of the cervix and often of the parametria, regional lymph nodes or those at a distance, have been seen so frequently as to need no elucidation as to diagnosis. The early lesions—those at a stage at which prognosis is best—are the most frequently overlooked. There may be nothing more than a relatively innocent appearing ulceration of one of the cervical lips, or there may be what appears to be a granular type of erosion present. A biopsy specimen must always be obtained from any suspicious area and it should be further emphasized that no treatment should be instituted until diagnosis of carcinoma has been established. Tuberculosis, syphilis, benign polypi and ulcerated myomata may simulate the symptoms and appearance of carcinoma.

The obtaining of a suitable bit of tissue by biopsy is usually not difficult. A punch biopsy forceps may be used, or a small wedge of tissue may be excised with a knife. Obviously, if one is dealing with a small early lesion it is possible to completely miss the carcinomatous area unless care is used in choosing the biopsy site, and usually it is better to take two or three bits of tissue than to rely on a single specimen. This procedure can be done as an office procedure with surprisingly little discomfort to the patient. A minimal amount of bleeding may follow and this can usually be controlled readily with a tampon or the use of silver nitrate. Occasionally a physician will be reluctant to do a biopsy because of the possible danger of dissemination of the growth. It is generally appreciated, however, that this danger is practically non-existent and is more than compensated for by the fact that an exact diagnosis can be made and proper treatment instituted without delay. Above all, the cautery should not be used nor amputation done until cancer has been ruled out. This is particularly true of erosions which have persisted for some time even though treated by means which ordinarily produce healing. In these circumstances repeated biopsy may be necessary, and occasionally cancer will be found when a previous examination gave negative results. It may be that in time we shall have other modes of detection which will be of help in recognizing the early lesions of this type of cancer. Such a method is now under trial in a number of centers and consists in the examination of a stained spread of cells taken from the vaginal fornix. The method seems to be promising, but needs much further study as well as the establishment of facilities for the examination of the "vaginal smears" before it can be widely applied.

The earliest lesions of cervical cancer occur in the epithelial border of the organ and cannot be detected by the eye. Iodine solutions used as recommended by Schiller, applied to the cervix, were supposed not to stain cancer bearing areas with the same intensity as the normal glycogen-bearing cells. It was hoped, therefore, that the use of such a detector might aid in indicating the best site for biopsy. The method has been widely tried and has finally fallen into disuse because a number of other non-malignant processes such as erosion and keratosis which are much more common than cancer react in much the same way to the iodine solution. But perhaps most disappointing was the discovery that if estrin therapy was being used for treatment of the menopausal syndrome—and the menopause coincides with the period of highest incidence of cancer of the cervix—then even cancer cells may take on glycogen-bearing proclivities and thus be completely hidden from discovery by the Schiller method. It has seemed well, therefore, to place little or no reliance in the method.

One should remember that cancer of the cervix may occur within the canal and thus not be observed upon the portio. The passage of a small curette into the cervix should be resorted to when bleeding or a brownish watery discharge persists after the vaginal surfaces of the cervix have been thoroughly tested and no lesion found.

Much of the same reasoning applies to cancer of the endometrium. Though endocervical and endometrial cancer are less frequently found than the squamous cancer of the portio, they are still sufficiently frequent to warrant a definite place in the process of diagnosis of uterine bleeding of unexplained origin.

It should be emphasized, therefore, that at present the most fruitful means for safeguarding women from the dangers of advanced cervical cancer consist of frequent examination of women over 35 years of age and the frequent use of the biopsy method of differentiating benign from malignant lesions.

TREATMENT

The medical profession has had long experience in the treatment of cancer of the cervix and has made great improvement, so that at present about 35 per cent of all patients with the disease may be afforded a "five-year cure." The results in so-called "early cases" may be much higher, or in the neighborhood of 55 or 60 per cent.

Much has been written about prophylaxis, but there is no positive way in which this can be done short of entire removal of the organ. Cleanliness, repair of the cervix after childbirth, and the treatment of erosions may be of some service in reducing the incidence, but this is not certain, for cancer may still make its appearance. Probably there will be no certain method of prophylaxis until the fundamental cause of the disease is known. Total hysterectomy cannot be the sole answer, for were it to be applied on a large scale, then almost certainly postoperative mortality and morbidity would exceed that due to the disease. For the present physicians must be content with the advantages afforded by early detection of cancer.

There are many methods of treatment and strong advocates for each. However, it is safe to say that, at present, operation should be the primary treatment only in the earliest cases. Small external lesions do not always mean that the lesion is any early one in the sense of the degree to which it may have invaded surrounding tissues or produced metastases. Hence, in some centers it has become customary to treat all lesions by radiation as a primary step. Some prefer to begin with radium intracervically and applied to the portio of the cervix in dosages aggregating from 4,000 to 6,000 milligram hours—this is particularly true of the smaller lesions. This to be followed by x-ray, because it has been shown by experience that only infrequently will lymphatic extensions be eradicated by radium alone. The x-ray treatments are usually given through four portals, two anterior and two posterior, directed toward the broad ligament areas. The total x-ray dosage should usually be in the neighborhood of 2,000 to 3,000 r as measured in air through each port. This combined treatment seems to have given the best results obtainable by radiation therapy alone. When the lesion is large, it is frequently better to give the x-ray therapy first to heal and shrink the growth so that the radium then may be employed about four weeks later in a more effective manner.

In a few patients who respond to the foregoing treatment so that the local lesion is healed, who are in good health, and particularly who are not obese, and who in addition have easily accessible veins, the radical or the Wertheim operation for total hysterectomy, with removal of the broad ligaments and upper third of the vagina may be carried out. But this should be done only by surgeons who are expert in the technique, for it is not only a formidable procedure but the complications following operation may be many. In good hands, however, the "five-year cure" rate may be increased as much as 10 per cent and the "ten-year cure" rate from 12 to 15 per cent.

It is rare indeed that operation should be the only means of therapy. The use of the term "operable cases" is most misleading, as it has been used to classify Stage I and Stage II lesions, or, in other words, those *supposed* to be confined to the cervix. Experience has taught that frequently in Stage II cases, and occasionally Stage I as well, the growth may in fact have metastasized and so be beyond the reach of operation. This is the basis for the thought that it usually is better judgment to utilize radiation first and then evaluate the situation later as to the applicability of operation. Thus it may be seen that surgical treatment should be used cautiously, rarely as the primary step toward cure; more frequently it may be used secondary to radiation, and that when used the radical wide dissection of the parametria, lymph nodes and upper vagina as well as total hysterectomy is the procedure which should be employed. Simple total or panhysterectomy has no place in the treatment of cancer of the cervix.

If, as is hoped, the time may come when physicians have to deal with larger numbers of very small or intraepithelial lesions of squamous cancer of the cervix, much of the foregoing with regard to the treatment of the disease may require modification. At present no one has had sufficient experience with the really early lesions to warrant a statement. It is encouraging to note, however, that more and more of the early processes are being discovered, and certainly in time the medical profession will be in a position to evaluate what is essential in the way of therapy.

PROGNOSIS

The outlook for patients with cancer of the cervix depends upon several factors, such as the stage of the lesion, the type of growth, the adequacy of treatment and the constitutional factors pertaining to the patient which aid or detract from the treatment. The following summary will give an indication of what can be expected with good management under usual patient circumstances.

	"Five-Year Cures"
Stage I	72%
Stage II	55%
Stage III	34%
Stage IV	3%

The absolute cures are, of course, much fewer in number; however, relative comfort for a five-year period as a result of therapy is a worthy aim for the profession. As absolute cures are obtained almost exclusively in Stages I and II, the importance of early diagnosis is clear. It may not be repetitious to emphasize here that yearly examination of the cervix by a competent physician will almost surely place any patient so observed within this category, if not an even more favorable one.

The ordinary causes of death from cancer of the cervix are uremia due to ureteral involvement, hemorrhage, sepsis and distant metastases.

Because of the frequency of ureteral involvement, careful appraisal of the urinary tract is prerequisite to radiation therapy, and frequently when the ureter is involved proper urological treatment can do much to prevent or allay pyeloureteritis and the dangers of uremia.

THE DUTY OF THE PHYSICIAN

The high incidence of carcinoma of the cervix makes it the most important malignant process occurring in women. The only other lesion which approaches it in frequency is cancer of the breast. Because the breast is palpable and can easily be seen by women, much progress has been made toward early recognition of cancer in the breast through education of the public concerning the early signs and symptoms. Unfortunately for the early detection of cancer of the cervix, the uterus is hidden within the woman's body, where it cannot be easily subjected to the same scrutiny by the woman herself, and hence she must—or should—depend upon her physician to make the examination. But how many women—or how many physicians, for that matter—are accustomed to demand the yearly physical examination? Relatively few, for the finding of early cancers of the cervix has not kept pace with the finding of early cancer of the breast. Thus it may be said that for the most part the chief improvements the medical profession has made in dealing with this disease, have been those pertaining to the techniques for treating well established and advanced lesions. To tell women to seek the physician's help when she experiences abnormal bleeding is but to beg the question, for bleeding is caused by ulceration and erosion of blood vessels, and this does not occur, as a rule, until invasion of the growth is well established. At present the annual or semi-annual examination by a careful physician is the only means by which the early, easily curable stage of this disease may be discovered.

Responsibility for this annual examination should rest with the physician. He should keep a card index of all women patients under his care and have his secretary or office nurse—or, lacking them, then his wife—notify each one yearly that she is due for examination. Such an examination should cover all physical matters needing follow-up, but cancer in all its forms should be uppermost in mind, and above all, adequate examination of the cervix and breasts should not be neglected in women patients.

SUMMARY

Approximately 17,000 women die every year of cancer of the cervix.

The cause of cancer of the cervix is unknown.

Squamous cell carcinoma arising in the portio of the cervix is the most common type.

Accurate "staging" of a cancer of the cervix is of the greatest importance in planning treatment and giving the probable prognosis.

Intermenstrual bleeding or postmenopausal spotting, however slight, should always arouse suspicion of cancer of the cervix or uterus.

A pelvic examination should include not only a bimanual examination but also visualization of the cervix with a proper speculum and a good light.

All suspicious lesions should be biopsied. The cautery should not be used nor amputation done until cancer has been ruled out.

There are many methods for treating cancer of the cervix. Each case must be considered as an individual problem. The method of treatment is planned after considering the microscopic grade and the stage and extent of the growth. Operation should be the primary treatment only in the earliest cases. The combined treatment (radium intracervically to 4,000 to 6,000 milligram hours followed by x-ray, 2,000 to 3,000 r through four ports) seems to give the best results from radiation therapy alone.

At present the most fruitful means for safeguarding women from the dangers of advanced cervical cancer consists of frequent examination of women over 35 years of age and the frequent use of the biopsy method of differentiating benign from malignant lesions.

"Tumors of the Brain and Spinal Cord" by H. C. Naffziger, M.D., and "Bone Tumors" by Don King, M.D., Chapters XXIX and XXX of the California Cancer Commission Studies, will appear in this section of the May issue of CALIFORNIA MEDICINE.

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EDITORIALS

Medical Rackets

Within the last year a new racket has sprung up in California, a promotional type of business which masks itself under some fancy title like "Universal Cooperative Health and Medical Association." The words "medical association" usually appear as a part of the title, for reasons which soon become obvious. These organizations operate at minimum expense from dingy offices, send out poorly mimeographed papers of agreement (contracts, if you please) to physicians, and probably salesmen to the gullible public. There is reason to believe that they make only a moderate impression on the public but the very existence of several such organizations indicates that at least some people fall for this kind of guff.

If anyone is interested in embarking upon this form of enterprise, the rules are simple. All you need do is coin a name, preferably with the words "medical association" in the title and, if possible, working in the word "American" so that a title of "American . . . . Medical . . . . Association" might be used to impress the unwary. Next, print up a schedule of fees for a variety of medical and surgical procedures, making the fees 30 per cent or more below the fees that people would normally expect to pay for such services from private physicians. Then mimeograph a rather shoddy letter to advertise yourself as "operating without profit" (not a corporation organized under the non-profit laws of California) which you send out to all the physicians in the state, asking them to agree to provide services at 30 per cent less than their usual fees to members of the "medical association."

Armed with these few items, hire a few salesmen on commission to go out among the working people and sell them on the idea that by paying a fee to your "medical association" the customer will be entitled to secure all of these wonderful services at cut rates from all the physicians in the state. Of course, if the physician the patient wants hasn't agreed to perform these services at these fees, the patient may call up the company and secure the name of one who will go along at the fees printed on the schedule.

Please note that nowhere along the line do you, as proprietor of the scheme, guarantee anything. Nowhere do you assure the physician that he will receive the fees on the cut-rate schedule. Nowhere do you make any guarantee to the patient that he can secure these services for these fees. All you do is to take the customer's money and tell him that since he is a member of your "medical association" he can secure these services from a physician at these fees. The poor customer is on his own in dealing with the physician he selects; the "medical association" has done nothing more than accept his dues or fees in exchange for a so-called privilege of dubious merit.

This type of enterprise is in our midst today. The operators have not bothered to incorporate, to secure licenses to sell insurance or to establish any financial or moral safeguards to protect the public or the medical profession. Apparently the only protection offered is to the pocketbook of the proprietor himself, and even that depends upon his success in enrolling new subscribers.

To the physicians who have been besieged by appeals to "join" such associations as participating physicians, it should be immediately apparent that the blandishments in the letters of solicitation are meaningless. It should also be pointed out that any physician who permits his name to be used and published by one of these organizations, or who even joins and thereby allows his name to be entered on a panel, is violating the capping and steering provisions of the Medical Practice Act. Further, the physician who joins is contributing his services at reduced fees and is actually rendering services for the direct profit of laymen, in violation of the Principles of Medical Ethics.

Senate Bill 970, now before the California Legislature, would control this type of business by placing it under the jurisdiction of the State Insurance Commissioner, who would by law invoke the usual requirements for operating an insurance business in the state. The California Medical Association will support this type of legislation. This racket must be stamped out before it causes direct harm to the public and indirect harm to the public and medicine alike in undermining public confidence in legitimate sickness cost insurance programs. Voluntary health insurance is a boon to the people of the state, and the fringe operations of greedy racketeers with snide schemes must not be permitted to reflect upon its good record.

Insurance—Good or Bad

The State Insurance Commissioner has written the California Medical Association regarding the continuing circularization of doctors by out-of-state insurance carriers who offer what appear to be bargains in accident and health insurance policies. He points out that these companies cross over state lines by using the mails and do not bother to take out licenses to sell their services in California. He also shows that in many cases the coverage offered by these companies is second grade or worse, often to the point of constituting a fraud and misrepresentation to the policyholder.

The Commissioner's point is well taken and gives cause to reiterate the old warning about reading the fine print as well as the large. In the words of one of our own members, "The large print giveth; the small print taketh away."

Toward Better Service for Hospitalized Patients

In order that the benefits of scientific medicine may reach the public, it is essential that conditions be such that the public have reasonable access to well trained physicians. It has been estimated that approximately 30 per cent of patients require hospitalization from time to time. When hospitalized they frequently need the services of such specialists as pathologists or radiologists. It is desirable that these specialists be readily available in hospitals. In order to avoid the possibility of inferior service to patients in this regard it is desirable that the conditions under which these specialists are appointed to hospital staffs be those which attract the competent.

It is therefore with pleasure that we note a forward step in the development of sound relationships between physicians and hospitals recently outlined by legal counsel for the California Medical Association and representatives of radiologists in this state. These groups, working at the direction of their respective bodies, have evolved a model contract for the appointment of radiologists in hospitals under ethical conditions. The outline is intentionally a broad one, inasmuch as conditions vary greatly from one district to another, and from hospital to hospital.

In general, the contract is one under which the physician practices his specialty as an "independent contractor" in the institution, and the hospital recovers all costs plus a reasonable return on its investment in space and equipment (or in space, when space alone is furnished). It is estimated by various investigators that the cost of conducting a modern radiological department in a private hospital of average size is between 33 and 45 per cent of the gross income of the department; to this figure may be added a reasonable percentage as a special return on investment (for example, 3 to 5 per cent). These sums should be paid to the hospital each month by the specialist or specialists conducting the department. An efficient method for the average private hospital is one under which the apparatus is furnished and maintained by the specialists involved.*

It is highly desirable that senior or experienced specialists be attracted to staff positions, so that the benefit of their knowledge may be available in the complex cases of all types and in all specialties which tend to gravitate to hospitals. Many administrators are conscious of the desirability of securing mature and able men for these posts, and no longer tend to seek the "just-graduated" for positions as departmental heads. If the physician is offered an ethical type of appointment and one under which there can be no question of dividing professional fees, then not only the institution but, much more important, the hospitalized sick will benefit. The new contract is to be commended.

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*Report of C.M.A. Committee, Calif. & West. Med., 46:419, June, 1937.

CALIFORNIA MEDICAL ASSOCIATION

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ED CLANCY, Field Secretary.....Southern California Office, 417 South Hill Street, Los Angeles 13

NOTICES AND REPORTS

Executive Committee Minutes

Tentative Draft: Minutes of the 213th Meeting of the Executive Committee, San Francisco, January 23, 1949.

The meeting was called to order by Chairman Shipman in the Association office at 10:30 a.m., Sunday, January 23, 1949.

Roll Call:

Present were Drs. Shipman, Alesen, Bruck and Kneeshaw, Secretary Garland, Editor Wilbur, Dr. D. H. Murray, Chairman of the Committee on Public Policy and Legislation, and Executive Secretary Hunton. A quorum present and acting. Absent: President Askey, attending a meeting as guest speaker.

1. *Secretarial Conference:*

It was regularly moved, seconded and voted to hold the annual conference of secretaries of county medical societies in San Francisco on Saturday, March 5, 1949, to be followed by a meeting of the Council on March 6, 1949. It was suggested that the secretarial conference be held in the San Francisco County Medical Society building if this is available.

2. *San Diego County Medical Society:*

(a) A communication was received from the San Diego County Medical Society, offering a suggested plan for inclusion in the A.M.A. public relations program and it was moved, seconded and voted to refer this suggestion to public relations counsel of the A.M.A.

(b) A request from the San Diego County Medical Society that the Association provide the Society with local public relations counsel was discussed and it was moved, seconded and voted that the Association offer to send official representatives to meet with the officers of the county society to discuss the local public relations problem.

3. *Public Policy and Legislation:*

(a) A resolution adopted by the Legislature of the State of Nebraska, memorializing the federal Congress to refrain from adopting compulsory health insurance legislation was read and discussed. It was moved, seconded and voted to refer this item to the Committee on Public Policy and Legislation and to write to the Nebraska Legislature the congratulations of the Association for this forward-looking action.

(b) Senate Bill 157, the Governor's health insurance bill, was discussed and it was suggested that amendments might be offered to provide a tax-supported system of furnishing all eligible citizens with legal service, food, clothing and other necessities of life, including morticians' services. The executive secretary was instructed to make inquiries into the total number of California residents now covered by some form of voluntary health insurance.

(c) An amendment to the Biologics Act, to include under the technical supervision and licensing of the State Department of Health those blood banks which do not make a charge for blood or its derivatives, was discussed and it was regularly moved, seconded and voted to approve this amendment and to sponsor it in the Legislature.

(d) It was regularly moved, seconded and voted that the Association again sponsor a proposed amendment to the Hospital District Act to provide safeguards against possible substandard staff membership conditions in hospitals constructed under the terms of the act.

4. *Public Relations:*

(a) An appeal for funds from the American Free Enterprise Association, Inc., was discussed and it was moved, seconded and voted that it be referred to public relations counsel for the A.M.A.

(b) Dr. Kneeshaw called attention to an item published by a syndicated newspaper columnist in which compulsory health insurance was decried and it was regularly moved, seconded and voted that this be forwarded to public relations counsel for the A.M.A.

5. *Cancer Commission:*

A request from Dr. Lyell C. Kinney for advice on the production of two additional films on examinations for cancer was discussed and it was regularly moved, seconded and voted that such films be produced at the expense of the Cancer Commission, possibly with financial assistance from the American Cancer Society, California Division.

6. *Extraprofessional Health Organizations:*

It was regularly moved, seconded and voted that Dr. L. H. Garland be named a member and vice-chairman of the Council's committee to evaluate health organizations outside strict professional ranks and that Dr. John W. Cline, chairman (Drs. L. A. Alesen, E. V. Askey, H. G. MacLean and D. H. Wilbur, members) be urged to continue his leadership of this committee with the assistance of the vice-chairman.

7. *Southern Pacific Medical Department:*

A letter was read from a physician whose services had been sought by the Southern Pacific Railroad's medical department and it was moved, seconded and voted that the Secretary look into the statements contained therein and report to the next Council meeting.

8. *Industrial Accident Commission:*

A request from insurance interests for establishment of a joint insurance-medical committee to consider downward revision of the proposed schedule of fees for compensation services was discussed and it was regularly moved, seconded and voted that this request be referred to the Council. It was also voted to notify all members of the possibility of solicitation of services at reduced fees.

9. *State Department of Education:*

Dr. Kneeshaw called attention to a series of conferences scheduled by the State Department of Education on subjects involving life in rural areas and it was regularly moved, seconded and voted that Dr. Kneeshaw or a representative to be named by him attend such conferences as an observer and participant in discussions.

Adjournment.

Sidney J. Shipman, M.D., *Chairman*
L. Henry Garland, M.D., *Secretary*

Suggested Model Contract for Hospital Radiologists

The following suggested model agreement is printed for the information of radiologists and other physicians desirous of completing contracts with private hospitals. This contract was prepared by and as a result of joint conferences between legal counsel for the California Medical Association and counsel for the Association of California Hospitals. It has been approved by the Council of the California Medical Association and is now under study, awaiting final action by a special committee of the hospital group.

The Council believes it is of sufficient interest and importance to the members of the California Medical Association to warrant publishing it in complete form.

MODEL RADIOLOGY AGREEMENT

This Agreement made and executed in duplicate at ________________, California, as of ____________, 19___, by and between ____________________ Hospital, a corporation, hereinafter designated as "Hospital," and ____________________ M.D., hereinafter designated as "Radiologist."

COMMENT

(In the event the hospital is a trust or an individual proprietorship, the above provision should be modified to indicate this.)

WITNESSETH:

Whereas, The Hospital is the owner and operator of a hospital at ____________________, California, in which there is located a Diagnostic and Therapeutic Radiological Unit, and

Whereas, The Radiologist is a duly qualified and certified specialist, and

Whereas, The parties hereto are desirous of entering into this agreement in order to provide a full statement of their respective covenants and agreements in connection with the operation of said Diagnostic and Therapeutic X-ray Unit in said Hospital during the term hereof;

Now, Therefore, For and in consideration of the premises and of the mutual covenants and agreements herein contained, it is understood and agreed by and between the parties hereto as follows:

First: The Hospital shall make available for the use of the Radiologist during the term hereof the space now occupied by its Diagnostic and Therapeutic Unit, and in addition thereto the Hospital shall supply and furnish, at its own cost and expense, for the use of the Radiologist such equipment as may be necessary for the proper operation and conduct of the said Unit. The Hospital shall also, at its own cost and expense, keep and maintain said equipment in good order and repair and upon said equipment or any part thereof becoming worn out or obsolete the Hospital shall replace the same with other equipment of similar character and utility. The Hospital shall also, at its own expense, furnish the Radiologist with ordinary janitor and in-house messenger service, laundry and such electricity for light and power, gas, water and heat as may be required by him for the proper operation and conduct of said X-ray Department. The Radiologist shall be a member of the active staff of the hospital and shall serve as chief of its department of radiology.

COMMENT

In the event the Radiologist owns and furnishes his own equipment, the above paragraph is not applicable, and language should be inserted to indicate that he is furnishing his own equipment and is responsible for repairs and replacement thereof. It also should be provided that in such event, he is responsible for the payment of all property taxes assessed against the property owned by him and space occupied by the X-ray Department. Such a paragraph could be written as follows:

ALTERNATIVE FIRST

"The Hospital shall make available for the use of the Radiologist during the term hereof the space now occupied by its Diagnostic and Therapeutic Unit. The Radiologist shall supply and furnish, at his own cost and expense, such equipment as may be necessary for the proper operation and conduct of said Unit. The Radiologist shall, at his own cost and expense, keep and maintain said equipment in good order and repair, and in the event said equipment or any part thereof shall become worn out or obsolete, the Radiologist shall replace the same with other equipment of similar character and utility. The Hospital shall, at its own expense, furnish the Radiologist with ordinary janitor and in-house messenger service, laundry, and such electricity for light and power, gas, water and heat as may be required for the proper operation and conduct of said X-ray Department. The Radiologist shall be responsible for and shall promptly pay all property taxes levied against the equipment owned by him and against the space occupied by his department."

Second: The Radiologist shall furnish at his own expense all necessary supplies such as films, chemicals, stationery and similar items. All nonmedical personnel required for the proper operation of the X-ray Department shall be employed by the Hospital—the selection and salaries paid such personnel to be subject to the joint approval of the Radiologist and the Hospital, provided that salaries of personnel classifications that are used in other departments of the Hospital shall be uniform, insofar as may be consistent with the recognized hazards of the work.

COMMENT

Some hospitals and doctors may prefer to work out an arrangement under which the employees in the Radiological Department are to be employed directly by the Radiologist. It is the belief of the attorneys for the Association of California Hospitals that such arrangement may jeopardize the welfare exemption if the Hospital is enjoying such exemption. This is on the theory that the law requires that the Hospital own and operate the exempt property, and they feel that if the employees are not the employees of the Hospital, the Hospital cannot claim that it is operating the department. If, however, it is the desire to have such arrangement, it is suggested that the following paragraph be used:

ALTERNATIVE SECOND

"The Radiologist shall furnish at his own expense all necessary supplies such as films, chemicals, stationery and similar items and expendable equipment. He shall choose (with the approval of the Hospital administration), employ and be responsible for all personnel that may be required for the proper conduct of the said department, including technicians, secretaries, and other necessary personnel."

Third: The Radiologist shall operate and conduct the X-ray Department at the Hospital, act as its director, and devote his best ability to the proper management thereof, using the premises solely for the practice of Radiology, and on an equitable and professional basis.

Fourth: The Radiologist shall perform, without compensation, such teaching and other duties as are in accord with the recommendations of the A.C.S. and the A.M.A. for accrediting hospitals of this type.

COMMENT

In the above paragraph, if the hospital is a teaching hospital or the Radiologist is to be compensated for his instruction work, the words "without compensation" should be eliminated from the above paragraph.

Fifth: The Radiologist and employees under his control shall comply with the policies, rules and regulations of the Hospital subject to the State and federal statutes covering his practice.

Sixth: The Radiologist shall perform without charge all radiological services (other than those for which a charge is collectible from sources other than the Hospital and its employees) required by the Hospital in caring for its employees who may be injured while on duty, and required by interns, residents, student nurses or other students in any department of the Hospital.

Seventh: The Radiologist's professional fees are in general accordance with customary local fees for comparable services and he shall submit herewith a schedule thereof to the Hospital authorities for their information, likewise any proposed changes in said schedule shall be submitted to the Hospital in advance. In the event there is any disagreement as to the fee schedule, such disagreement shall be referred to the executive committee of the medical staff of the Hospital for determination, and if said executive committee does not have a radiologist and pathologist upon it, then the Radiologist shall have the right to appoint a radiologist of his choosing to act as a member of said committee solely for the purposes of this paragraph. The determination of the said executive committee shall be binding upon both parties. If there shall arise any question concerning the character of services furnished in the X-ray Department, the Radiologist or the Hospital shall have the right to submit such matter for determination to said executive committee and its decision in that regard shall be final.

COMMENT

The above provision has been drafted to avoid any contention that there has been a setting of professional fees by a lay person. It is believed that the arbitration provisions of this paragraph will be rarely used since the initial fee schedule is established upon the effective date of the agreement, and it is expected that any changes can be worked out by the administrator of the Hospital and the Radiologist without difficulty. It should be borne in mind that in large hospitals two or more senior qualified radiologists are necessary for the proper care of patients.

Eighth: The Radiologist shall file daily with the business office of the Hospital a memorandum of all x-ray services rendered, and the Hospital shall collect as his agent such bills so rendered, at the same time as hospital bills owing by said patients are collected. In the case of out-patients, the Radiologist shall issue his own bills, except to clinic and nonpay cases.

COMMENT

It is to be noted that in the above paragraph it is provided that the Radiologist shall do his own billing for out-patient work. However, it is suggested that it may be better for both parties if this sentence is eliminated and the Hospital do all billing. In billing for radiological services, the Hospital need not send out separate bills as one of the purposes of this arrangement is to avoid multiple billing. The hospital must indicate on its statements that it is the "billing agent for Doctor ______________________, Radiologist," some place on the billhead.

Ninth: On or before the __________ day of each month, the Hospital shall present to the Radiologist a statement and accounting of all his fees for radiological services rendered to in-patients and out-patients for the preceding month together with a check for his fees to be fixed as follows:

From the total of all billing from said preceding calendar month covering radiological services as heretofore provided, the Hospital shall deduct _____ per cent from the billings for in-patients' work and _____ per cent for out-patients' work as an allowance for bad debts, and _____ per cent of the remaining amount shall be the Radiologist's net fees which shall be paid over to the Radiologist with said statement. The remainder thereof shall be retained by the Hospital as compensation to it for the facilities and services furnished by it under the terms of this agreement. The above percentages for bad debts shall be adjusted every six months so that they shall reflect the record of bad debts for the previous six months' period based upon the collection experience for that period.

It is further understood that the Radiologist will not charge professional fees to indigent persons, nonpay clinic cases and persons to whom professional courtesy is customarily extended.

COMMENT

It should be noted in the above paragraph that the percentage is based upon billings rather than upon collections. This was because it is believed that it is much simpler from an accounting viewpoint to determine billings than to apportion collections where there is partial collection. Also, if the contract were to be based upon collections, it would be necessary to make payments over a period of years after the termination of the contract. In using billings as a base, if the parties desire to make an allowance for bad debts, this allowance must be tied to actual experience. In setting the contract up initially, the bad debt deduction should be based upon the record of the most recent collections for the Hospital. The bad debt allowance may be divided into in-patient and out-patient business or may be lumped together as the parties desire. If the parties feel that a bad debt allowance is too cumbersome they may eliminate this provision from the contract entirely.

An additional provision may be added to paragraph *Ninth* when it is customary for the Hospital or its employees to compensate the Radiologist for the cost of supplies and materials used in connection with work done for the Hospital employees under the provisions of paragraph *Sixth* of this contract. These payments would be paid by the Hospital rather than the employee when the Hospital is carrying its Workmen's Compensation insurance ex-medical. Such a provision might provide as follows:

"In addition to the above payments provided for in this paragraph, the Hospital shall compensate the Radiologist for the cost of materials used in connection with the services performed in paragraph *Sixth* of this contract."

Tenth: In the performance of the work, duties and obligations devolving upon him under this contract, it is mutually understood and agreed that the Radiologist shall be and he at all times is acting and performing as an independent contractor practicing his profession of medicine and surgery and specializing in x-ray diagnosis and treatment; that the Hospital shall neither have nor exercise any control or direction over the methods by which the Radiologist shall perform his work and functions excepting that said Radiologist does by this contract agree to perform his said work and functions at all times in strict accordance with currently approved methods and practice in his professional specialty, and that the sole interest of the Hospital is to assure that said Diagnostic and Therapeutic X-ray work and service shall be performed and rendered in a competent, efficient and satisfactory manner. All applicable provisions of law relating to licensing and regulating of physicians or hospitals shall be fully complied with by all parties hereto. As a member of the medical staff the Radiologist will cooperate with and assist other members of the staff in preparation of clinical reports for publication and will use his best efforts to elevate the standing of the Hospital staff in the field of medical science by publication of unusual or interesting studies made in the Radiological Department.

Eleventh: This agreement shall remain in full force and effect for a term of__________years from and after the ________________________, provided, however, that either of the parties hereto shall have the right and privilege of cancelling and terminating this agreement on __________ days' notice to the other and upon the expiration of said notice this agreement shall be and become of no further force or effect whatsoever and each of the parties hereto shall be relieved and discharged therefrom.

COMMENT

The above provision is effective if the arrangement is based upon a percentage of billings. If, however, the arrangement is based upon collections then it will be necessary to make some provision to compensate the Radiologist for his share of collections made for his work performed during the term of the contract, but collected after the termination of the contract. This could be done by accounting for the accounts receivable upon the books and deducting therefrom an allowance for expected bad debts based upon the experience of the Hospital for the previous period. Another method would be to provide that after the accounting for the collections for the current month, the Radiologist had no further interest in collections after that date. This is a matter of negotiation between the parties.

In Witness Whereof, The Hospital has caused this agreement to be executed and its corporate seal to be hereunto affixed by its officers thereunto duly authorized and the Radiologist has executed this agreement by hereunto setting his hand as of the day and year first above written.

By____________________________

By____________________________

C.P.S. Fee Schedule

The following is a copy of a letter sent by California Physicians' Service to Dr. William L. Bender, chairman of the Fee Schedule Committee appointed by the Council of the California Medical Association to revise the C.P.S. fee schedule:

"Dear Doctor Bender:

"For the purpose of discussing the revised fee schedule prepared by your committee, the Board of Trustees of C.P.S. held a special two-day meeting on February 26th and 27th, most of which was devoted to a study of the schedule. Your letter of transmittal and the revised schedule had been mailed to the trustees two weeks before the meeting, so that all might be familiar with their content.

"Because of the tremendous amount of ground covered in this complete revision, it was felt advisable to appoint a sub-committee of the board to meet with members of your committee, in order to discuss financial implications, policy changes and other matters that were suggested by the Fee Schedule Committee. Dr. Goin appointed Dr. Kendrick Smith of Los Angeles (chairman), Dr. J. Frank Doughty of Tracy, Dr. Henry L. Gardner and Mr. Ransom M. Cook, both of San Francisco, with Drs. Larsen and Gardenier to furnish any needed technical advice. It is my understanding that a meeting of this sub-committee with members of your committee has been arranged for March 5th, in order to discuss these questions frankly.

"The board has asked me to express to you and your committee our sincere appreciation for the tremendous job that you have done. We realize that it is timely that the fee schedule be completely reviewed with respect to overhead of the profession and recent developments in the practice of medicine. We also recognize the time and effort that the committee has put into this work, and assure you that every practical consideration will be given to your recommendations. We believe that members of the profession likewise should know of the fine job that you have done, and are so informing them."

Sincerely yours,

Chester L. Cooley, M.D., *Secretary*

In Memoriam

Ball, Wendell Lee. Died November 14, 1948, aged 36. Graduate of the University of Oregon Medical School, Portland, 1938. Licensed in California in 1938. Doctor Ball was a member of the Monterey County Medical Society, the California Medical Association, and the American Medical Association.

✣

Bewley, Marietta Helen. Died in Los Angeles, February 14, 1949, aged 75, of carcinoma. Graduate of the University of Southern California School of Medicine, Los Angeles, 1900. Licensed in California in 1901. Doctor Bewley was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

Edelstein, Jacob A. Died November 1, 1948, aged 60. Graduate of Fordham University School of Medicine, 1918. Licensed in California in 1918. Doctor Edelstein was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Grant, John Francis. Died in Long Beach, January 18, 1949, aged 57. Graduate of Northwestern University Medical School, Chicago, 1917. Licensed in California in 1920. Doctor Grant was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Loomis, Frederic Morris. Died in Piedmont, February 9, 1949, aged 71, of a heart ailment. Graduate of the University of Michigan Medical School, Ann Arbor, 1912. Licensed in California in 1917. Doctor Loomis was a retired member of the Alameda County Medical Association, and the California Medical Association.

✣

Moulton, Dan Hazen. Died in Chico, February 10, 1949, aged 70, of a cerebral hemorrhage. Graduate of the University of California Medical School, Berkeley-San Francisco, 1902. Licensed in California in 1902. Doctor Moulton was a retired member of the Butte-Glenn County Medical Society, and the California Medical Association.

✣

Stamler, Allan Erwin. Died in Corcoran, February 7, 1949, aged 46, of coronary thrombosis. Graduate of the University of Illinois College of Medicine, Chicago, 1926. Licensed in California in 1940. Doctor Stamler was a member of the Kings County Medical Society, the California Medical Association, and the American Medical Association.

✣

Stein, Charles. Died in Long Beach, January 22, 1949, aged 72. Graduate of the University of Nebraska College of Medicine, Omaha, 1907. Licensed in California in 1917. Doctor Stein was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Stanley R. Truman of Oakland was elected president-elect of the American Academy of General Practice at the organization's annual scientific assembly which was held last month in Cincinnati. He succeeds to the presidency in 1950. The Academy was founded in 1947 to raise the standards of general practice, to work with organizations of medical specialists toward improving medical care, and to promote education designed especially for the physician intending to enter general practice.

IMPERIAL

Dr. Clarence R. Kroeger has been appointed full-time health officer of Imperial County. Dr. Kroeger, formerly with the health department of Tucson, Arizona, takes the place of Dr. Burke E. Schoensee who had been serving on a part-time basis.

LOS ANGELES

Three cancer training grants, one for the University of California at Los Angeles School of Medicine and two to the University of Southern California School of Medicine were made last month by the National Cancer Institute. The grant to U.C.L.A. was $10,000 for evaluation of cancer diagnostic tests under the direction of Dr. Andrew H. Dowdy. One of the U.S.C. grants was $25,000 for expansion of the present training program under Dr. Ian Macdonald, and the other was $5,000 to support improvements in a training program under Dr. George S. Sharp.

HUMBOLDT

Dr. Myron W. Husband, formerly of Burbank, recently was appointed health officer of Humboldt County.

SACRAMENTO

Dr. D. F. Dozier has been elected president of the Sacramento chapter of the American Academy of General Practice. He succeeds Dr. John Gregory Walsh, who was elected president at the first meeting last fall to serve during the organizational period of the chapter. Other officers are **Dr. John Long,** vice-president; **Dr. John Royane,** secretary-treasurer; **Dr. Dan Kilroy,** chairman of the membership committee; and **Dr. Peter Koch,** chairman of the program committee.

SAN FRANCISCO

Dr. John A. Anderson of the University of Utah has been appointed professor of pediatrics and head of the pediatric department of the Stanford University School of Medicine, it was announced recently. In these positions, which he will assume September 1, Dr. Anderson will succeed Dr. Harold K. Faber, who will become professor emeritus at that time.

* * *

Promotion of four members of the faculty of Stanford University School of Medicine to full professorships, two to associate professorships and two to assistant professorships was announced last month. A list of the promotions, which become effective September 1 at the beginning of the academic year, follows:

To professor: **Donald James Gray, Ph.D.,** anatomy; **Donald E. King, M.D.,** surgery (bone and joint); **Hadley Kirkman, Ph.D.,** anatomy; **John Kent Lewis, M.D.,** medicine.

To associate professor: **Robert Hastings Dreisbach, M.D.,** pharmacology; **Robert Stuart Turner, Ph.D.,** anatomy.

To assistant professor: **Frederick A. Fuhrman, Ph.D.,** physiology; **Clarence M. Tinsley, M.D.,** medicine.

* * *

Continuing a reciprocal exchange of personnel between the two schools, Stanford University School of Medicine has granted to **Dr. Frank Gerbode,** assistant clinical professor of surgery, a five-month leave of absence for medical research and teaching at Saint Bartholomew's Hospital, London. Last year Dr. Frank Rundle, assistant director of the surgical professorial unit at St. Bartholomew's, visited Stanford on a Rockefeller Fellowship.

* * *

Two postgraduate courses, one in obstetrics and gynecology and one in psychiatry and neurology, have been announced by the University of California Medical School, University Extension. The course in **obstetrics and gynecology** will be held **July 5-8, 1949,** and that in **psychiatry and neurology,** a repetition of a previous course, is scheduled for the 12 weeks **August 29 through November 18.** Both are to be held in San Francisco. Applications for registration and requests for further information should be directed to Stacy R. Mettier, M.D., Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22.

SAN JOAQUIN

Dr. Elmer M. Bingham, a member of the staff of the San Joaquin Local Health District since 1946, recently was named director of the district to succeed Dr. John J. Sippy, who died only a short time after he resigned the directorship March 1. Dr. Sippy organized the District 26 years ago and had served as its director until his resignation.

GENERAL

According to word received by the State Department of Public Health, **production of Rocky Mountain spotted fever vaccine has been discontinued** by the U.S. Public Health Service laboratory at Hamilton, Montana. Neither the tick-tissue type vaccine nor the chick-embryo type which superseded it will be made hereafter, but tick-tissue vaccine will be available as long as the present supply lasts.

Commercial laboratories now manufacture chick-embryo type vaccine for Rocky Mountain fever in adequate quantity. Branch offices in the West from which it may be obtained are identified by Dr. Wilton T. Halverson, state director of public health, as follows:

Los Angeles, Calif:

Lederle Laboratories, 2811 Leeward Ave. (Zone 5).
Sharp & Dohme, 2821 East Pico Blvd. (Zone 23).
E. R. Squibb & Sons, 1855 Industrial St. (Zone 21).

San Francisco, Calif.:
Lederle Laboratories, 883 Mission St. (Zone 3).
Sharp & Dohme, 132 Second St. (Zone 5).
E. R. Squibb & Sons, 690 Fourth St. (Zone 7).

Denver 2, Colo.:
Lederle Laboratories, 444 Fourteenth St.
Sharp & Dohme, 1525 Wynkoop St.

Portland 12, Ore.:
Sharp & Dohme, 3808 North Williams Ave.

Salt Lake City 1, Utah:
Lederle Laboratories, 351 South Main St.

Seattle, Wash.:
Lederle Laboratories, 703 Terminal Sales Bldg. (Zone 1).
E. R. Squibb & Sons, 804 Sixth Ave., S. (Zone 4).

* * *

A warning that **Syrup of Urethane**, a cough syrup manufactured by Marvin R. Thompson, Inc., **may cause a dangerous lowering of the white blood cell count** when used in the quantity recommended on the label, has been issued by the Federal Food and Drug Administration. Seizure of the product is being made by the Administration and the manufacturer has acted to recall it from the market, but the manner and extent of distribution are such that neither the manufacturer nor federal, state and local health officers will be able to locate all bottles promptly, the federal agency said. More than 2,300 gallons of the product have been distributed to physicians, wholesale druggists and retail pharmacists in packages ranging in size from half-ounce physicians' samples to one-gallon bottles.

* * *

The **American Congress of Physical Medicine** will hold its **27th annual scientific and clinical session** September 6-10, 1949, at the Netherland Plaza Hotel, Cincinnati. All sessions will be open to members of the medical profession in good standing with the American Medical Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

* * *

The first scientific meeting of the recently organized **American Academy of Neurology** is scheduled for June 1-3 at French Lick Springs, Indiana.

Established to "further and encourage the practice of clinical neurology and to stimulate teaching and research in neurology and allied sciences," the Academy at present has 500 members. Active membership is open to physicians who have been certified in neurology. Junior membership is available to physicians engaged in postgraduate studies in neurology or who are awaiting certification in neurology. In addition, there is an associate membership for those who are not certified in neurology but whose interests are in fields related to neurology.

* * *

The **Western Association of Industrial Physicians and Surgeons will holds its annual meeting** in the Biltmore Hotel, Los Angeles, Saturday, May 7, the day before the opening of the California Medical Association Annual Session. Scheduled for discussion at the meeting, which is to start at 9:15 a.m. and continue until 5 p.m., are matters dealing with state compensation insurance and its administrative problems. The industrial section of the State Nurses Association and members of the Western Association of Industrial Nurses have been invited as guests for the session. There will also be a discussion of technical subjects of interest to industrial physicians. Further details or copies of the program may be obtained by writing to Jerome Shipping, M.D., president, 740 South Olive Street, Los Angeles 14. or to the secretary, Christopher Leggo, M.D., California and Hawaiian Sugar Refining Corporation, Ltd., Crockett, Calif.

Annual Golf Tournament

Under the auspices of the Southern California Medical Golf Association, the Annual Golf Tournament will be held Monday afternoon, May 9, at the Los Angeles Country Club. All members attending the meeting are welcome to play. Numerous prizes will be awarded. Make reservations with Clyde O. Wood, M.D., secretary, Southern California Medical Golf Association, 9629 Brighton Way, Beverly Hills, telephone, CRestview 1-5205.

BOOK REVIEWS

THE SHAME OF THE STATES. By Albert Deutsch. Harcourt, Brace and Company, New York, 1948. $3.00.

Albert Deutsch's book is an outgrowth of a series of articles on current conditions in state mental hospitals which he wrote for the New York Star. It is a journalistic survey with a camera-documented story of conditions in public mental hospitals. The author is a leader in the field of humanitarian journalism. His earlier book, "The Mentally Ill in America—A History of Their Care and Treatment from Colonial Times," provided a good background for his investigations.

The author states that he visited about two-score mental institutions, but he reports on only about a dozen. The faults of these institutions are primarily reported. The statistical data are meagre. The presentation of facts is journalistic in manner. An interpretive formulation to account for the defects is put forth. The blame is laid at the doorsteps of the state hospital system. The author emphasizes that in the final analysis the public is responsible for it. The primary purpose of the book is to acquaint the public with the need for and to arouse support toward reform of state mental institutions.

A few criticisms may be ventured. The reviewer happens to have visited five of about the dozen mental institutions which were reported on. While admitting of the great need for tremendous improvement, in some instances the defects were somewhat exaggerated, the services minimized, and the limitations were not sufficiently appreciated by the author. In places, attempts are made to secure emotional appeal rather than to present neutral facts.

Nevertheless, the book for the most part correctly describes a great need in a popular way. It fills a gap in public education between the newspaper "asylum horror tale" and the colorless scientific statistics of professional research. It is a book that can be recommended to be read by all, lay as well as professional people.

* * *

THE RENAL ORIGIN OF HYPERTENSION. By Harry Goldblatt, M.D., C.M., Director, Cedars of Lebanon Hospital, Professor of Pathology, University of Southern California. Charles C. Thomas, Publisher, Springfield, Illinois, 1948. $2.75.

From time to time since his first reports on the experimental production of arterial hypertension, Goldblatt has reviewed critically the pertinent literature and presented his own views. In this short monograph, one of the American Lecture Series, he indicates clearly why he believes human essential hypertension to be of renal origin. Not as detailed as previous reviews of the subject by Goldblatt or others, and without the "practical" aspects so often desired by practitioners, the book seems very well suited to the student of medicine whether he be in practice or in medical school.

* * *

MANUAL OF PUBLIC HEALTH—HYGIENE. By J. R. Currie, M.D., Professor-Emeritus of Public Health, University of Glasgow, and A. G. Mearns, M.D., Senior Lecturer and Examiner in Hygiene, University of Glasgow. Third edition. 212 illustrations, four color plates. The Williams and Wilkins Company, Baltimore, 1948. $9.00.

This comprehensive text on hygiene from the British viewpoint pretty well covers the field of preventive medicine and what is called by Oxford "Social Medicine" and Cambridge "Human Ecology."

"Hygiene" is designed for medical and public health students and for practitioners of public health. The definitions given are usually legal in nature. For example, mental defectiveness is defined as "a condition of arrested or incomplete development of mind existing before the age of 18 years." In whatever field of hygiene there are laws or regulations, the gist of these is given.

The major part of the work is devoted to the basic functions of organized public health service, such as maternal and child health, statistics, food hygiene, housing, and industrial and mental hygiene. There is an excellent section on food poisonings of various types with good color illustrations. The chapter on "Community Diseases" is unique in its scope.

The last chapter of the book entitled "The Social Vista" gives a factual statement of the various insurance and public assistance laws, and the relationship of the general practitioner and public health officer to these laws is indicated.

* * *

AN EVALUATION OF SELECTED SCHOOLS OF NURSING WITH RESPECT TO CERTAIN EDUCATIONAL OBJECTIVES. By Helen Nahm, Director of the Division of Nursing Education, Duke University, Durham, N. C. Published for the American Psychological Association by Stanford University Press, 1948. $2.00.

This is essentially a statistical report on many questions posed to determine whether student nurses are satisfied with nursing as a profession, whether or not professional nurses: are democratic rather than autocratic in their beliefs and practices, apply principles of mental hygiene, are well adjusted, have a wide range of social, cultural and recreational interests and activities, and are interested in and understand current social, political and economic problems and issues.

For many years nursing educators have agreed on desirable objectives of nursing education. The author chose a limited number of them and administered questionnaires to 428 senior students in 12 schools of nursing in Minnesota. Of this number, 27 per cent were enrolled in degree programs and 73 per cent in three-year programs.

Since hundreds of test items were used and the results of many are tabulated and graphed, only by studying the questions and the responses carefully can one glean specific information on the test results.

In general, the conclusions are not surprising. The findings seem to indicate that first and foremost there is need for better preparation of faculty members for schools of nursing, that many schools of nursing are not being conducted as truly educational institutions, that an authoritarian rather than democratic philosophy prevails in some schools, that shorter hours of work are needed as well as better health supervision and programs, and that there is a necessity for improved recreational and social facilities.

* * *

MANUAL OF CLINICAL LABORATORY METHODS. By Opal E. Hepler, Ph.D., M.D., Associate Professor of Pathology, Northwestern University Medical School. With foreword by James P. Simonds, Ph.D., M.D. Charles C. Thomas, Publisher, 201 East Lawrence Ave., Springfield, Illinois, 1949. $8.50.

This book is an expanded outline of laboratory methods prepared for use in the teaching of medical students and laboratory technicians. It is not designed to be a textbook of clinical pathology and does not discuss the clinical significance of the results of the tests.

The reviewer can give this book high praise: it does what it sets out to do and serves a most useful purpose. It may be highly recommended for any laboratory, for technicians and for medical students; but it is for the small laboratory which is an adjunct to the office of the practicing physician that it should prove especially helpful. The physician or the technician may readily find information about unfamiliar tests or laboratory methods which he has forgotten. The writing is explicit. Each procedure is detailed in step by step construction. For each test, the principles, general considerations, methods of performance, normal values, and interpretation of findings are listed in order. There are good charts and plates summarizing the findings of such essential laboratory data as the cerebrospinal fluid findings in diverse disease conditions, the morphological appearances of red and white blood cells, and the normal and pathological values in hematology. Diagrams are frequently used to illustrate different pieces of apparatus. The print is large, so that the volume may be left open on a table and read from a distance. The construction is sturdy.

There is little that can be said against this book. One may rightly assert that the references to source work are too few and that the tests given are not at all inclusive, but these are minor criticisms. They do not detract from the fact that the author has done a first class, clear, practical job.

* * *

AN INTRODUCTION TO SURGERY, Fourth Edition. By Rutherford Morison, M.D., F.R.C.S., Edin. Formerly Professor of Surgery, Durham University, and Charles F. M. Saint, C.B.E., M.D., M.S., F.R.C.S. Formerly Professor of Surgery, Cape Town University, South Africa. The Williams and Wilkins Company, Baltimore, Maryland, 1948. $10.00.

This book represents an elementary introduction to surgery, covering basic principles such as shock, hemorrhage, inflammation, malignant disease, tuberculosis, syphilis, bone disease and fractures as well as other subject matters. A good part of the material is presented very briefly in outline form. Too many pages are devoted to syphilitic and tuberculous lesion that may be common in South Africa, but are unusual or rare in this country.

Parts of the book, written as a result of the personal experience of the senior author, are presented in a conversational manner. The book is necessarily sketchy because it is rather small and still covers a wide latitude of conditions. One wonders whether a practitioner might better refer to a more comprehensive textbook of surgery which would take up each of the problems in more detail.

* * *

YOUR CHILD OR MINE — THE STORY OF THE CEREBRAL-PALSIED CHILD. By Mary Louise Hart Burton in collaboration with Sage Holter Jennings. Coward-McCann, Inc., New York, 1949. $1.25.

This booklet tells the stories of several patients with cerebral palsy and how by proper supervision, education and training they were enabled to adjust themselves to their handicaps and to live useful and happy lives. While recognizing the limitations inherent in the nature of the problem, the author takes a proper attitude of hopefulness toward it. Physicians with such patients might well recommend this book to the parents for their encouragement.

* * *

THE FRONTAL LOBES. Proceedings of the Association for Research in Nervous and Mental Disease. December 12 and 13, 1947, New York. 237 illustrations, 39 tables. Vol. XXVII. The Williams and Wilkins Company, Baltimore, 1948. $12.50.

This record of the meeting of the Association for Research in Nervous and Mental Disease in the last month of 1947 contains almost all human knowledge of the form and function of the frontal lobes. Inspired by recent interest in frontal lobe function incidental to the section of this lobe for psychiatric disease and intractable pain, it far transcends this limited outlook. The contributions of the various members range from the broadly philosophical to the microanatomical.

There are four main divisions, entitled Biology of the Frontal Lobes, Experimental Studies, Clinical Studies, and Frontal Lobotomy. It is doubtful if any reader will find himself equipped to follow competently all of the discourses, but it is equally certain that every physician will find some of the contributions of great interest. Certainly, anyone who ever has occasion to consider frontal lobotomy as a therapeutic procedure cannot do better than to familiarize himself with the information contained in this book.

* * *

CONDITIONED REFLEXES AND NEURON ORGANIZATION. By Jerzy Konorski, head of the Department of Neurophysiology in the Nencki Institute of Experimental Biology and Professor in the University of Lodz. Translated from the Polish Ms. under the author's supervision by Stephen Garry. Cambridge University Press—The Macmillan Company, 60 Fifth Ave., New York 11, N. Y., 1948. $4.00.

This short book is dedicated by the author to Pavlov and Sherrington "in the hope that this work will do something to bridge the gulf between their respective achievements." As the book was written by a man who at one time was a member of the Pavlovian school, one can look to it with some confidence as an authoritative source of information on the theories of conditioned reflexes. In this regard it is of considerable value in making accessible to English readers much that is otherwise difficult to find. Whether the attempt to reconcile or modify Pavlov's theories to fit in with modern concepts of neurophysiology has done more than to introduce yet another theory of integrated nervous activity remains to be seen.

The presentation is clear enough, but quite complicated, and it is a book which needs a good deal of digestion. It is aimed more at the neurophysiologist than the physician.

MEDICAL JURISPRUDENCE

COMPENSATION FOR PROFESSIONAL SERVICES RENDERED

PEART, BARATY & HASSARD *of the California Bar*

When a physician renders professional services to a person who subsequently dies, or to an incompetent person, or to a minor, or to a person who later is adjudged bankrupt, the problem of determining the correct procedure to obtain compensation becomes exceptionally important. This article will concern itself, therefore, with the procedures whereby compensation for professional services rendered by a physician to persons in any of those four classes may be obtained.

1. *Claim Against the Estate of a Decedent:*

Where a physician has rendered professional services to a person who subsequently dies before paying the physician's fees, it is necessary to seek compensation from the estate of that deceased person. The method of collecting this compensation is governed by the California Probate Code and a failure to follow its requirements is likely to result in inability to secure payment. Upon the death of a person leaving an estate if there is a will, an executor is appointed. If there is no will, then an administrator of the estate is appointed. Upon the appointment of the executor or administrator, a "notice to creditors" must be published in a newspaper at least once a week for a period of four weeks. At any time within six months from the date of first publication of this notice to creditors, persons having claims against the estate of the decedent may file such claims with the executor or administrator, or the clerk of the superior court.

Anyone to whom the decedent was indebted, who fails to present a claim in the form required by law within this six months' period, *thereby forfeits his right to payment from the estate.* Thus it is absolutely essential, upon the death of a person from whom compensation is due, to ascertain the date of first publication of notice to creditors and file a proper creditor's claim within six months thereafter.

Creditor's claims must be in the form required by the Probate Code. They must be in writing and must set forth with reasonable particularity the nature of the claim. In addition they must include the amount due and must be accompanied by an affidavit of the claimant, or someone on his behalf, that the amount is justly due; that no payments have been made thereon by the decedent which are not credited and that there are no offsets to the claim to the knowledge of the claimant. After a creditor's claim is prepared it must be sworn to before a notary public and must then be presented either to the executor or administrator, or to the clerk of the superior court wherein probate of the estate is pending.

After a creditor's claim is presented to the executor, administrator or clerk of the court, it may be allowed or it may be rejected in part and allowed in part. It may also be wholly rejected by the executor or administrator. If it is allowed, it is then submitted for the approval of the court, and if approved, it must be paid before any assets may be distributed to the heirs, devisees or legatees. If allowed for only a portion of the claim, or entirely rejected, the claimant may acquiesce and, of course, he then does not receive full compensation. But if the claimant does not acquiesce, he must commence legal action against the estate on the rejected claim within three months after the date of service upon the claimant of notice of rejection. If the executor or administrator fails to take affirmative action on the claim, such failure to act may be treated by the claimant as equivalent to a rejection and the claimant may seek recourse by way of a legal action.

2. *Claims Against the Estate of an Incompetent Person:*

When professional services are rendered for a person who is, or subsequently becomes, incompetent, compensation for such services can be had from the guardian of that person's estate. A person who is incompetent within the meaning of California Probate Code Section 1460 is supposed to be under the care of a guardian of his person and estate appointed by the superior court. A statement for services rendered should be presented to the guardian.

In order to be compensable, professional services rendered to such a person should be rendered at the request of the guardian if one has been appointed, for then the guardian is responsible therefor, but only out of assets of the estate of the incompetent; that is to say, a guardian may not be required to pay for the professional services rendered out of his own funds unless he has previously agreed to do so.

3. *Compensation for Services Rendered to Minors:*

When services are rendered to minors, at the request of either parent, or a guardian appointed by the superior court, compensation for those services is recoverable from the parent, or from the guardian.

If professional services are rendered to a minor without the direction or authorization of his parent or guardian, it is still possible that compensation may be recovered from the minor. California Civil Code Section 36 provides that a minor

> "can not disaffirm a contract, otherwise valid, to pay the reasonable value of things necessary for his support or that of his family, entered into by him when

> not under the care of a parent or guardian, able to provide for him or them; provided, that these things have been actually furnished to him or to his family."

There are three important points which should be noted in this section. First, an agreement by a minor alone to pay for professional services rendered to him may be enforceable against him. Second, whether enforceable or not as against the minor, it may be enforced against his parents.

Third, a contract on the part of a minor to pay the reasonable value of things necessary for his support is only valid and enforceable when he is not under the care of a parent or guardian able to provide for him.

4. *Claims Against a Bankrupt:*

If a patient either by voluntary or involuntary action is adjudged bankrupt, after professional services have been rendered, but before payment therefor has been made, it is necessary for the physician to present a claim against the patient's estate in bankruptcy. A claim in bankruptcy must be established by the filing with the referee of bankruptcy appointed by the court a written statement under oath signed by the claimant setting forth the nature of the claim and the consideration therefor, whether or not any security is held by the claimant and that the sum claimed is justly owing from the bankrupt to the claimant. This claim must be filed within six months after the appointment of the trustee in bankruptcy.

Forms for establishing proof of claim in bankruptcy can be obtained and in making proof of claim the form prescribed by the Supreme Court of the United States should be used.

If a person goes into bankruptcy and lists as one of his creditors a physician who has performed professional services on his behalf and such physician does not within six months from the date of adjudication of bankruptcy file a claim in the proper manner, all legal right to secure any compensation for such services is lost.

In conclusion it may be noted that a claim by a physician for compensation for professional services rendered to any of the persons in the above four categories must strictly comply with the forms and the time limitations prescribed by law.

* * *

E. VINCENT ASKEY
President

R. STANLEY KNEESHAW
President-Elect

PROGRAM AND PRE-CONVENTION REPORTS

for the

CALIFORNIA MEDICAL ASSOCIATION

Seventy-eighth Annual Session

Los Angeles, May 8-11, 1940

Biltmore Hotel

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Guest Speakers

L. HOWARD SCHRIVER

ANDERSON HILDING

NATHAN A. WOMACK

KELLOGG SPEED

GEORGE E. BURCH

CHESTER M. JONES

—Fabian Bachrach Photo

Guest Speakers

L. Howard Schriver, Cincinnati, Ohio—President, Associated Medical Care Plans, Inc., The National Association of *Blue Shield* Plans.

Nathan A. Womack, Iowa City, Iowa—Professor of Surgery, Head of Department of Surgery, Iowa State University School of Medicine.

George E. Burch, New Orleans, Louisiana—Professor of Medicine and Chairman of the Department of Medicine, Tulane University.

Anderson Hilding, Duluth, Minnesota—Clinical Professor of Otology, University of Minnesota Medical School.

Kellogg Speed, Chicago, Illinois—Clinical Professor of Surgery (Rush), University of Illinois.

Chester M. Jones, Boston, Massachusetts—Clinical Professor of Medicine, Harvard Medical School.

* * *

SECTION GUESTS AND ADDITIONAL INVITED SPEAKERS

J. Harvey Black, Dallas, Texas—Professor of Clinical Medicine, Southwestern Medical Foundation.

R. H. Flocks, Iowa City, Iowa—Professor of Genito-Urinary Surgery, Iowa State University School of Medicine.

Frederick E. Mohs, Madison, Wisconsin—Associate Professor of Chemosurgery, University of Wisconsin School of Medicine.

Mr. Wm. A. Richardson, Rutherford, New Jersey—Editor, *Medical Economics*.

Homer P. Rush, Portland, Oregon—Clinical Professor of Medicine, Head of the Department of Cardiology, University of Oregon Medical School.

Herman Sharlit, New York City—Assistant Professor of Clinical Dermatology and Syphilology, Postgraduate Medical School, New York University, and Associate Director of the Skin and Cancer Unit, University Hospital.

Lulu K. Wolf, R.N., Los Angeles—Professor of Nursing, and Chairman, Department of Nursing, University of California at Los Angeles.

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Members of House of Delegates—46th Annual Session

TOTAL DELEGATES (225)

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H. Gordon MacLean (1951)	Councilor-at-Large
Eugene F. Hoffman (1949)	Councilor-at-Large
Sidney J. Shipman (1950)	Councilor-at-Large
Wilbur Bailey (1950)	Councilor-at-Large
C. V. Thompson (1949)	Councilor-at-Large

ELECTED DELEGATES (204)

Delegates	*Alternates*
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Grant Ellis	Samuel P. Hall
James B. Graeser	Lester B. Lawrence
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Lloyd Kindall	Paul C. Samson
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James Raphael	P. R. Shumaker
T. E. Reynolds	Richard A. Young
Stanley R. Truman	
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Contra Costa County (2)	
Kaho Daily	George Husser
L. H. Fraser	Christopher Leggo
Fresno County (4)	
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Neil J. Dau	O. B. Doyle
E. C. Halley	W. H. Gilliatt
Eliot Sorsky	C. S. Mitchell
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Imperial County (1)	
George C. Holleran	F. Powers Heald
Inyo-Mono County (1)	
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Kern County (3)	
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Chester I. Mead	Carl Moore
Roderick A. Ogden	J. E. Vaughan
Kings County (1)	
William F. Chamlee	Robert G. Moles
Lassen-Plumas-Modoc County (1)	
Wilbur C. Batson	Fred Davis, Jr.
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Roger W. Barnes	Daniel Beltz
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A. Elmer Belt	R. T. Bergman
Terry C. Bennett	John E. Bergmann
B. J. Bergstrom	Kenneth H. Boyer
Frederic K. Bergstrom	Lyman A. Brewer
Clarence J. Berne	John R. Brophy
John W. Beswick	L. C. Burwell
Robert L. Blackmun	Tenero D. Caruso
Edwin F. Boyd, Sr.	John L. Caster
Kenneth C. Brandenburg	Victor Cefalu
James L. Bray	Burr Dalton
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George E. Brown	Kenneth S. Davis
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George W. Caldwell	Karl L. Dieterle
Donald Cass	J. James Duffy
Rafe C. Chaffin	Milo Ellik
Burt T. Church	Homer S. Elmquist
Wells C. Cook	Charles V. Emerson
Clair P. Cosgrove	Ralph A. Ferguson
Jay B. Cosgrove	Charles A. Foulks
William E. Costolow	Garland F. Garrett
Charles H. Cowgill	Glenn G. Graham
Frank G. Crandall, Jr.	Francis E. Guinney
Lawrence L. Craven	Russel C. Hadley
Philip J. Cunnane	Donald Q. Heckel
G. R. Dunlevy	J. Severy Hibben
Franklin Farman	Walter M. Holleran
Ward L. Fisher	Leland G. Hunnicut
Paul D. Foster	Arthur H. Hurd
Benjamin Frees	Theodore S. Kimball
F. J. Gaspard	Carl E. Krugmeier
Charles W. Gilfillan	E. R. Lambertson
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Elizabeth Mason Hohl	C. Harry Linsley
Howard P. House	Ben D. Massey

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Herbert J. Kirchner	H. G. McNeil
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Buell H. Sprague	John W. Whitsett
Justin J. Stein	Louis F. X. Wilhelm
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Delegates	*Alternates*
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Louis L. Robinson	Rafael G. Dufficy

Mendocino-Lake County (1)

Delegates	*Alternates*
Clemens M. Beil	E. C. Bennett

Merced County (1)

Delegates	*Alternates*
George Pimentel	John P. Buckley

Monterey County (2)

Delegates	*Alternates*
J. B. McCarthy	H. E. Clark
A. L. Wessels	Keith W. Corp

Napa County (1)

Delegates	*Alternates*
Dwight H. Murray	Harry Baker

Orange County (4)

Delegates	*Alternates*
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Russell Johnson	John Davis
G. Wendell Olson	A. Norton Donaldson
J. B. Price	Harold Neslund

Placer-Nevada-Sierra County (1)

Delegates	*Alternates*
William M. Miller	Harry March

Riverside County (2)

Delegates	*Alternates*
Fred Clark	W. H. Blackman
Frederick A. Veitch	Elmer A. Hankins

Sacramento County (5)

Delegates	*Alternates*
Orrin Cook	Herbert Burden
Dave F. Dozier	Frank W. Lee
Dan O. Kilroy	John B. Long
Dudley Saeltzer	Frank A. MacDonald
James H. Yant	Ralph C. Teall

San Benito County (1)

Delegates	*Alternates*
Eberle C. Sheldon	Roswell L. Hull

San Bernardino County (5)

Delegates	*Alternates*
Meredith G. Beaver	James C. Carmack
Carl M. Hadley	John H. Coughlin
J. Needham Martin	Thomas F. Dempsey
E. L. Tisinger	Frank C. Melone
Arthur E. Varden	Thomas I. Zirkle

San Diego County (9)

Delegates	*Alternates*
Douglass H. Batten	H. G. Holder
William C. Black	John S. Martin
E. A. Blondin	A. E. Moore
Morton N. Carlile	Willard H. Newman
Roger C. Isenhour	Thomas F. O'Connell
Francis E. Jacobs	J. G. Omelvena
Hirman D. Newton	James W. Ravenscroft
R. J. Prentiss	J. T. Wells
Wesley S. Smith	F. E. West

San Francisco County (26)

Delegates	*Alternates*
H. Glenn Bell	Dorothy W. Atkinson
William L. Bender	Walter Beckh
Gerson R. Biskind	Lois H. Brock
William G. Burkhard	Donald A. Carson
Edmund Butler	Chester L. Cooley
L. R. Chandler	Lawrence R. Custer
Martin W. Debenham	Anthony B. Diepenbrock
G. Dan Delprat	William T. Duggan
Lloyd B. Dickey	Henry L. Gardner
Frederick S. Foote	Frank L. A. Gerbode
Ivan C. Heron	Henry Gibbons III
Alson R. Kilgore	Keene O. Haldeman
Carleton Mathewson, Jr.	Allen T. Hinman
M. Laurence Montgomery	Clyde D. Horner
Clayton D. Mote	Charles W. Leach
Charles A. Noble, Jr.	James J. McGinnis
J. Marion Read	Edmund J. Morrissey
Emmet L. Rixford	Thomas F. Mullen
Francis Rochex	Leon O. Parker
William L. Rogers	Wesley E. Scott
Robert A. Scarborough	Ralph Scovel
H. Brodie Stephens	Samuel R. Sherman
William A. Sumner	Abraham B. Sirbu
Robertson Ward	Donald R. Smith
Helen B. Weyrauch	William W. Washburn
David A. Wood	A. Justin Williams

San Joaquin County (3)

Delegates	*Alternates*
J. Frank Doughty	C. A. Broaddus
Jack Eccleston	Ray Owens
Neill Johnson	George Wever

San Luis Obispo County (1)

Delegates	*Alternates*
Robert O. Pearman	Richard T. Treadwell

San Mateo County (3)

Delegates	*Alternates*
Carl Benninghoven	R. D. Borley
Logan Gray	D. W. Boudett
Stuart Lindsay	Ian W. Luke

Santa Barbara County (3)

Delegates	*Alternates*
Douglas McDowell	Max Hammel
Alfred B. Wilcox	R. W. Lambuth
	Delbert H. McNamara

Santa Clara County (6)

Delegates	*Alternates*
Burt Davis	Holden E. Brink
Thomas N. Foster	William Harder
J. P. Josephson	Edward T. Liston
Leslie B. Magoon	Paul V. Morton
James C. Muir	Sydney F. Thomas
John Hunt Shephard	John C. Wilson

Santa Cruz County (2)

Delegates	*Alternates*
Luther Newhall	Philip K. Gilman
Samuel B. Randall	Allen J. Pederson

Shasta County (1)

Delegates	*Alternates*
H. T. Hinman	Roy Thomas

Siskiyou County (1)

Delegates	*Alternates*
J. B. McGuire	C. C. Dickinson

Solano County (2)

Delegates	*Alternates*
Carlton C. Purviance	Matthew Gibbons
Felix J. Rossi, Jr.	H. R. Madeley

Sonoma County (2)

Delegates	*Alternates*
Cuthbert M. Fleissner	Alexis G. Maximov
Donovan C. Oakleaf	Roscoe L. Zieber

Stanislaus County (2)

Delegates	*Alternates*
John H. Czatt	Joseph L. Azevedo
Andrew van de Pol	

Tehama County (1)

Delegates	*Alternates*
E. R. Wilson	James T. McDuffie

Tulare County (2)

Delegates	*Alternates*
W. B. Parkinson	J. H. Brady
W. A. Winn	S. S. Ginsburg

Ventura County (2)

Delegates	*Alternates*
A. A. Morrison	W. Cloyce Huff
G. K. Ridge	A. H. Stoll

Yolo County (1)

Delegates	*Alternates*
John Homer Woolsey	William Blevins, Jr.

Yuba-Sutter-Colusa County (1)

Delegates	*Alternates*
Stanley R. Parkinson	John Wesley Lindstrum

Agenda of House of Delegates Meetings

1949 Annual Session

(46th Annual Session)

The House of Delegates will meet in the Music Room of the Hotel Biltmore

Speaker, L. A. Alesen, *Los Angeles*
Vice-Speaker, Donald Charnock, *Los Angeles*
Secretary, L. Henry Garland, *San Francisco*

FIRST MEETING

Sunday, May 8, 1949, at 4:30 p.m.

Order of Business

1. Call to order.
2. Report of Committee on Credentials, and Organization of the House of Delegates.
3. Roll call.
4. Announcement and approval of Reference Committees.
   (*a*) Committee on Credentials. (Delegates must register with the Committee.)
   (*b*) Reference Committee on the Reports of Officers, the Council and Standing and Special Committees. (Reference Committee No. 1.)
   (*c*) Reference Committee on Finance, to review the reports of the Secretary-Treasurer and the Executive Secretary and to study and make recommendations to the House of Delegates on the budget submitted by the Council and the amount of dues for the ensuing year. (Reference Committee No. 2.)
   (*d*) Reference Committee on Resolutions, Amendments to the Constitution and By-Laws and New and Miscellaneous Business. (Reference Committee No. 3.)
   (*e*) Reference Committee on Executive Session, to consider business brought before the House of Delegates in Executive Session. (Reference Committee No. 4.)
5. Address by President—E. Vincent Askey.
6. Miscellaneous announcements by the Speaker. (Stenographic service, to secure triplicate copies of resolutions, etc.)
7. Report of the Council—Edwin L. Bruck, chairman.
8. Report of the Trustees of the California Medical Association—E. Vincent Askey, president.
9. Report of the Auditing Committee—Sidney J. Shipman, chairman.
10. Report of the Secretary—L. Henry Garland.
11. Report of the Executive Secretary—John Hunton.
12. Recess.—(At 8 o'clock the House of Delegates will recess. Elected and ex-officio members of the House will then convene under the chairmanship of the president of the Board of Trustees of California Physicians' Service, to function with Board of Administrative Members of California Physicians' Service. With the adjournment of the meeting of C.P.S. Administrative Members, the C.M.A. House of Delegates will convene, to act again as the House of Delegates of the California Medical Association.)

Meeting of Administrative Members of California Physicians' Service

1. Roll call.
2. Report of the President—Dr. Lowell S. Goin.
3. Report of the Secretary—Dr. Chester L. Cooley.
4. C.P.S. Administration Business Report, by the Executive Director—Mr. W. M. Bowman.
5. Appointment of Nominating Committee for Trustees and Administrative Members at Large.
6. Introduction of Resolutions.
7. Recess—for 24 hours. (Time of reconvening will be stated.)
8. Consideration of the Report of the Nominating Committee.
9. Consideration of resolutions.
10. New business.

Reconvening of House of Delegates

13. Report of the Editor—Dwight L. Wilbur.
14. Reports of District Councilors.
15. Reports of Councilors-at-Large.
16. Report of Legal Counsel—Peart, Baraty & Hassard.
17. Reports of Standing and Special Committees:

    A. Standing Committees:

    (*a*) Executive Committee—Sidney J. Shipman.
    (*b*) Committee on Associated Societies and Technical Groups—Robert A. Scarborough.
    (*c*) Committee on Audits—Sidney J. Shipman.
    (*d*) Committee on Health and Public Instruction—Orrin Cook.
    (*e*) Committee on History and Obituaries—Morton R. Gibbons, Sr.
    (*f*) Committee on Hospitals, Dispensaries, and Clinics—Carroll B. Andrews.
    (*g*) Committee on Industrial Practice—Donald Cass.
    (*h*) Committee on Medical Defense—Nelson Howard.
    (*i*) Committee on Medical Economics—H. Gordon MacLean.
    (*j*) Committee on Medical Education and Medical Institutions—L. R. Chandler.
    (*k*) Committee on Organization and Membership—Carl L. Mulfinger.
    (*l*) Committee on Postgraduate Activities—John C. Ruddock.
    (*m*) Committee on Publications—George Dawson.

- (*n*) Committee on Public Policy and Legislation—Dwight H. Murray.
- (*o*) Committee on Scientific Work (Annual Session)—L. Henry Garland.
- (*p*) Cancer Commission—Lyell C. Kinney.
- (*q*) Editorial Board—Dwight L. Wilbur.

B. Special Committees:

- (*a*) Delegates to the American Medical Association—John W. Cline.
- (*b*) Physicians' Benevolence Committee—Axcel E. Anderson.
- (*c*) Advisory Planning Committee—John Hunton.
- (*d*) Committee on Revision of Constitution and By-Laws—Sam J. McClendon.
- (e) Committee on Crippled Children's Act—Frederic Ewens.
- (*f*) Committee on Study of Alcoholism—Cullen W. Irish.
- (*g*) Blood Bank Commission—John Upton.
- (*h*) Committee on Industrial Health—Christopher Leggo.
- (*i*) Committee on Rural Medical Service—Carroll B. Andrews.

18. Old and Unfinished Business.
    - (*a*) Constitutional Amendments.
19. New Business.

SECOND MEETING

Tuesday, May 10, at 4:30 p.m.

ORDER OF BUSINESS

1. Call to order.
2. Supplemental Report of Credentials Committee.
3. Roll call.
4. Secretary's announcement of Council's selection of place for the 1950 annual session.
5. Election of Officers:
    - (*a*) *President-Elect.*
    - (*b*) *Speaker.*
    - (*c*) *Vice-Speaker.*
    - (*d*) *District Councilors* (three-year term):*

      Third District—Harry E. Henderson, Santa Barbara (term expiring).

      Third District—Inyo, Kern, Mono, San Luis Obispo, Santa Barbara and Ventura counties.

      Sixth District—Edwin L. Bruck, San Francisco (term expiring).

      Sixth District—San Francisco County.

      Ninth District—John W. Green, Vallejo (term expiring).

      Ninth District—Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Siskiyou, Solano, Sonoma and Trinity counties.
    - (*e*) *Councilors-at-Large (three-year term):*

      (Note.—*Each vacancy among Councilors-at-Large, Delegates and Alternates is considered in turn. Each vacancy is voted on separately.*)

      Eugene F. Hoffman, Los Angeles (term expiring).

      C. V. Thompson, Lodi (term expiring).
    - (*f*) *Delegates to the American Medical Association:*

      Delegates are elected for two calendar years. At this session of the C.M.A. House of Delegates, terms of Delegates elected for calendar years 1950-1951 will expire on December 31, 1951.

      For terms January 1, 1950, to December 31, 1951

      Incumbents
        - (*a*) Robertson Ward, San Francisco (term expiring).
        - (*b*) Sam J. McClendon, San Diego (term expiring).
        - (*c*) Lowell S. Goin, Los Angeles (term expiring).
        - (*d*) John W. Green, Vallejo (term expiring).
        - (*e*) Additional Delegate to A.M.A. (no incumbent).
    - (*g*) *Alternates to American Medical Association:*
        - (*a*) Anthony B. Diepenbrock, San Francisco (alternate to Robertson Ward).
        - (*b*) Bon O. Adams, Riverside (alternate to Sam J. McClendon).
        - (*c*) Eugene F. Hoffman, Los Angeles (alternate to Lowell S. Goin).
        - (*d*) Frank A. McDonald, Sacramento (alternate to John W. Green).
        - (e) Alternate to additional Delegate to A.M.A. (no incumbent).
6. Announcement by Secretary.

   Council's nominations of members of Standing Committees. (For approval by the House of Delegates.)
7. Reports of Reference Committees:
    - (*a*) Report of Reference Committee No. 1 on Reports of Officers, the Council, and Standing and Special Committees.
    - (*b*) Report of Reference Committee No. 2 on Reports of the Secretary-Treasurer and the Executive Sectary, on budget and dues.
    - (*c*) Report of Reference Committee No. 3 on Resolutions, Amendments to the Constitution and By-Laws and New and Miscellaneous Business.
    - (*d*) Report of Reference Committee No. 4 on business brought before the House of Delegates in Executive Session.
8. Unfinished Business.
9. New Business.
10. Presentation of Officers:

    President
    President-Elect
    Speaker
    Vice-Speaker
11. Presentation of Certificate to Retiring President—E. Vincent Askey.
12. Approval of Minutes. (Committee to edit.)
13. Adjournment.

LEWIS A. ALESEN, *Speaker*
L. HENRY GARLAND, *Secretary*

**Procedure of nomination of District Councilors is outlined in paragraph 3 of Article VII, Section 1, of C.M.A. constitution, adopted on May 8, 1940:*

The nine district Councilors shall be elected as follows:

Prior to the time set for election of district Councilors, the delegates of each Councilor district for which a councilorship is about to become vacant, shall submit in writing to the Secretary-Treasurer the names of one or more nominees to fill the said vacancy.

The Secretary-Treasurer shall transmit the names of such nominee or nominees so submitted to him to the House of Delegates on or before the time set for the election.

A vote shall be taken by the House of Delegates upon the nominee or nominees so submitted and, in the event that only one nominee has been submitted, the House of Delegates may, by a majority vote, either elect or refuse to elect said nominee.

If the House of Delegates shall reject the sole nominee of the delegates from the councilorship district concerned, then said delegates must immediately thereafter submit an additional nominee or nominees and the House shall proceed to vote thereon; if there is but one nominee, the House may elect or reject.

If, after such time as the Speaker may allow, delegates within such councilor district fail to submit an additional nominee or nominees, the House of Delegates may then proceed to make nominations from the floor of the House and a vote shall then be taken by the House of Delegates to determine who shall be elected to the vacant councilorship.

All nominees for district councilorships must be members in good standing, residing within the district in which the vacancy exists.

SCIENTIFIC ASSEMBLIES

General Meetings

FIRST GENERAL MEETING

SUNDAY, MAY 8

10:00 – Ballroom, Biltmore Hotel

10:00 – Address of Welcome—Benjamin M. Frees, M.D., President, Los Angeles County Medical Association.

10:05 – Greetings from the Woman's Auxiliary—Mrs. Lawrence K. Gundrum, President, Woman's Auxiliary to the California Medical Association.

10:10 – Address of the President—E. Vincent Askey, M.D., Los Angeles.

10:40 – Good Medical Care for the American People—L. Howard Schriver, M.D., Cincinnati, Ohio, by invitation.

11:10 – Nutritional Aspects of Anastomotic Operations—Chester M. Jones, M.D., Boston, Massachusetts, by invitation.

11:35 – Benign Diseases of the Breast—Nathan A. Womack, M.D., Iowa City, Iowa, by invitation.

12:00 – Nursing for the Future—Lulu K. Wolf, R.N., Los Angeles, by invitation.

SECOND GENERAL MEETING

TUESDAY, MAY 10

9:10 – Ballroom, Biltmore Hotel

Chairmen: George B. Robson, M.D., San Francisco
A. Morse Bowles, M.D., Santa Rosa

9:10 – Demonstration—Our Responsibility for the Earlier Diagnosis of Cancer—Leonard Dobson, M.D., San Francisco.

9:30 – Injuries to the Carpus—Kellogg Speed, M.D., Chicago, Illinois, by invitation.

9:55 – Some Phases of Postoperative Pulmonary Atelectasis—Anderson Hilding, M.D., Duluth, Minnesota, by invitation.

10:20 – The Management of Acute Myocardial Infarction—George E. Burch, M. D., New Orleans, Louisiana, by invitation.

10:45 – Question and Answer Period.

Clinical-Pathological Conference

11:00 – Case No. 1—Pathologist Owen F. Thomas, M.D., Santa Rosa. Clinician Charles A. Noble, M.D., San Francisco. Surgeon Nathan A. Womack, M.D., Iowa City, Iowa, by invitation.

11:45 – Case No. 2—Pathologist John Budd, M.D., Los Angeles. Clinician Chester M. Jones, M.D., Boston, Massachusetts, by invitation. Surgeon Nathan A. Womack, M.D., Iowa City, Iowa, by invitation.

THIRD GENERAL MEETING

WEDNESDAY, MAY 11

9:30 – Ballroom, Biltmore Hotel

What's New in Medicine

Chairman: E. Vincent Askey, M.D., *President*

9:30 – What's New In Gynecology—James C. Doyle, M.D., Beverly Hills.

9:50 – What's New In Aureomycin and Other Antibiotics—Henry Brainerd, M.D., San Francisco.

10:10 – What's New In Abdominal Surgery—Nathan A. Womack, M.D., Iowa City, Iowa, by invitation.

10:30 – What's New In Cardiology—George E. Burch, M.D., New Orleans, Louisiana, by invitation.

10:50 – What's New In Gastroenterology—Chester M. Jones, M.D., Boston, Massachusetts, by invitation.

11:10 – What's New In Otolaryngology—Anderson Hilding, M.D., Duluth, Minnesota, by invitation.

11:30 – What's New In Orthopedics—Kellogg Speed, M.D., Chicago, Illinois, by invitation.

11:50 – What's New In British Medicine—Mr. Wm. A. Richardson, Editor, Rutherford, New Jersey, by invitation.

Questions in writing to the Speakers: These will be discussed after each presentation.

Section Meetings

GENERAL MEDICINE

George B. Robson, M.D., San Francisco, *Chairman*
Lewis T. Bullock, M.D., Los Angeles, *Secretary*
DeWitt Burnham, M.D., San Francisco, *Assistant Secretary*

GEORGE B. ROBSON
Chairman, General Medicine

LEWIS T. BULLOCK
Secretary, General Medicine

SUNDAY, MAY 8

1:30 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Practice and Allergy

1:30 – **Demonstration—Electrocardiographic Clinical Pathological Demonstration** — Electrocardiograms illustrating common patterns will be discussed as unknowns followed by brief presentation of clinical and pathological findings.—Francis L. Chamberlain, M.D., William Paul Thompson, M.D., Morris Lipson, M.D., and William H. Thomas, M.D.

Panel Discussion

2:00 – **Hypersensitivity Diseases**

Moderator: Lowell A. Rantz, M.D., San Francisco

The program will be conducted as a panel. The members will give short talks following which they will participate in a general discussion of the whole problem of hypersensitivity. Opportunity will be given for questions from the audience.

Immunological and Experimental Aspects of Hypersensitivity Disease—Frederick Moore, M.D., Los Angeles, by invitation.

Histamine and Antihistamine Drugs—Edmund L. Keeney, M.D., San Diego.

Loeffler's Syndrome—George Piness, M. D., Los Angeles.

Peripheral Vascular Manifestations of Hypersensitivity—George E. Burch, M.D., New Orleans, Louisiana, by invitation.

Gastro-intestinal Allergy—Chester M. Jones, M.D., Boston, Massachusetts, by invitation.

MONDAY, MAY 9

9:00 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Surgery, General Practice and Radiology

Symposium

Diseases of the Gastro-intestinal Tract

Chester M. Jones, M.D., Moderator
Nathan A. Womack, M.D., Surgical Consultant
Thomas N. Foster, M.D., Radiological Consultant

The Gastro-intestinal system will be covered in a general way by the experts with highlights on newer thoughts and with specific 15 minute papers.

9:00 – **Demonstration—Benign Tumors of the Gastro-intestinal Tract: Radiological Demonstration.**

9:30 – **Introductory Remarks to Symposium.**

9:45 – **The Problem of the Acquired Short Esophagus**—H. Brodie Stephens, M.D., San Francisco.
Discussion.

10:15 – **Result of Five Years' Treatment of Peptic Ulcer and Ulcerative Colitis with Enterogasterone and Hog Duodenum**—Lester M. Morrison, Los Angeles.
Discussion.

10:45 – **Acute Pancreatitis**—John Paxton, Los Angeles.

11:00 – **Chronic Relapsing Pancreatitis**—Dwight L. Wilbur, M.D., San Francisco.
Discussion.

11:30 – **Strangulation Obstruction of the Small Intestine**—Harold P. Totten, M.D., Los Angeles.
Discussion.

12:00 – Pain in the Right Lower Quadrant Due to Malrotation and Malfixation of the Right Colon—Edmund Butler, San Francisco.

Discussion.

TUESDAY, MAY 10

1:30 – Ballroom, Biltmore Hotel

1:30 – Demonstration—The Kidney in Health — A Motion Picture.

2:00 – Business Meeting of Medical Section.

2:05 – Practical Aspects of Water Metabolism—George E. Burch, M.D., New Orleans, Louisiana, by invitation.

2:35 – Clinical Potassium Problems—Helen Martin, M.D., Los Angeles.

2:55 – Manifestations of Magnesium Metabolism—Hugh Edmondson, M.D., Los Angeles.

3:10 – Discussion.

3:25 – Recess.

3:30 – Fundamental Facts of Fat Metabolism—Harry J. Deuel, Jr., Ph.D., Los Angeles, by invitation.

3:50 – Metabolic Effect of Vitamin B_{12} in Pernicious Anemia—Stacy R. Mettier, M.D., Russell Tat, M.D., San Francisco, and Alice McBride, A.B., San Francisco, by invitation.

Discussion.

4:15 – Definition of an Internist—Verne R. Mason, M.D., Beverly Hills.

4:35 – Recess—Meeting of the California Society of Internal Medicine.

WEDNESDAY, MAY 11

1:00 – Ballroom, Biltmore Hotel

Symposium

Heart Disorders*

1:00 – Demonstration—The Nature of the Auricular Flutter and Fibrillation—A Motion Picture—Myron Prinzmetal, M.D., Los Angeles, et al.

2:00 – The Role of the Kidney in the Excretion of Digitoxin—Rene Bine, M.D., Meyer Friedman, M.D., San Francisco, and Sanford O. Byers, Ph.D., San Francisco, by invitation.

2:25 – A Review of the Results of Massive Penicillin Therapy in Seventy Cases of Subacute Bacterial Endocarditis—George C. Griffith, M.D., Pasadena, and David C. Levinson, M.D., Los Angeles, by invitation.

2:50 – Studies with Mercuhydrin Tagged with Radioactive Mercury—George E. Burch, M.D., New Orleans, Louisiana, by invitation.

3:20 – New Drugs in Cardiac Arrhythmias—Morris H. Nathanson, M.D., Los Angeles.

3:45 – Experience with Vitamin “E” in Coronary Disease—Homer P. Rush, M.D., Portland, Oregon, by invitation.

4:10 – Newer Methods for the Evaluation of Patients for Lumbar Sympathectomy—Travis Winsor, M.D., Los Angeles.

4:35 – Recess—Business Meeting and Election of Officers of the California Heart Association.

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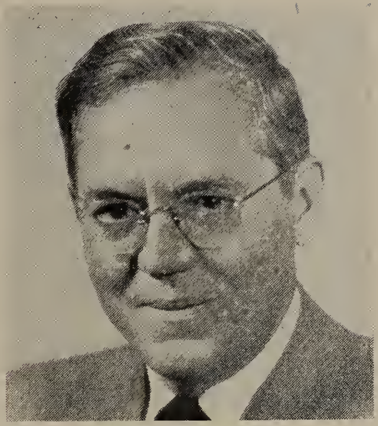
*This program has been arranged jointly by the Section on General Medicine and the Medical Division of the California Heart Association.

GENERAL SURGERY

A. Morse Bowles, M.D., Santa Rosa, *Chairman*
Conrad J. Baumgartner, M.D., Los Angeles, *Secretary*
Frank Gerbode, M.D., San Francisco, *Assistant Secretary*

A. MORSE BOWLES
Chairman, General Surgery



CONRAD J. BAUMGARTNER
Secretary, General Surgery

SUNDAY, MAY 8

2:00 – Biltmore Bowl

2:00 – **Chairman's Address: The Present Attitude Toward Gallbladder Surgery**—A. Morse Bowles, M.D., Santa Rosa.

Discussion.

2:20 – **Benign Lesions of the Colon**—Ralph V. Byrne, M.D., Los Angeles.

Discussion.

2:40 – **Surgical Management of the Injured Large Bowel**—Samuel Gendel, M.D., Anaheim.

Discussion.

3:00 – **A Clinico-Anatomical Study of Volvulus of the Colon and Ascending Colon**—Harold L. Lindner, M.D., San Francisco.

Discussion.

3:20 – **Complete Multiple Polyposis of the Colon**—Theodore C. Lawson, M.D., Oakland.

Discussion.

3:40 – **Volvulus of the Sigmoid Colon**—Walter L. Byers, M.D., Oakland.

Discussion.

4:00 – **Use of Low Transverse Incision in Resection of the Rectum with End-to-End Anastomosis.** L. S. Cherney, M.D., San Francisco.

Discussion.

4:20 – **Complications of Colostomy**—Walter Birnbaum, M.D., San Francisco.

Discussion.

MONDAY, MAY 9

9:30 – Ballroom, Biltmore Hotel

Joint Meeting with General Medicine, General Practice, and Radiology

For Program, see Section on General Medicine.

TUESDAY, MAY 10

2:00 – Biltmore Theater

2:00 – **Intraoral Cancer**—E. J. Joergenson, M.D., Glendale, Samuel Perzik, M.D., and Paul H. Deeb, M.D., Los Angeles.

Discussion.

2:20 – **The Nature and Relief of the Symptoms of Cholecystitis**—Nathan A. Womack, M.D., Iowa City, Iowa, by invitation.

Discussion.

2:40 – **Choledochogastrostomy with Gastric Mucosal Tube in the Repair of Certain Strictures of the Bile Ducts**—Carl L. Hoag, M.D., Leon Goldman, M.D., H. Glenn Bell, M.D., San Francisco, and Frederick Binkley, M.D., San Francisco, by invitation.

Discussion.

3:00 – **Business Meeting.**

3:10 – **Acute Cholecystitis in the Aged Patient**—Harry A. Davis, M.D., R. N. Brown, M.D., by invitation, and W. A. Scharffenberg, M.D., by invitation, Los Angeles.

Discussion.

3:30 – **Cholangiography Following Common Duct Drainage**—Clarence E. Rees, M.D., San Diego.

Discussion.

3:50 – The Relation of the Incidence of Local Skin Recurrences Following Radical Mastectomy to the Area of Skin Excised—E. William Rector, M.D., Sacramento.

Discussion.

4:10 – Benign Cysts of the Pancreas Simulating Neoplasm—Carleton Mathewson, Jr., M.D., San Francisco.

Discussion.

4:30 – The Surgical Significance of the Non-Visualizing Gallbladder—R. Bruce Henley, M.D., and Edwin G. Clausen, M.D., Oakland.

Discussion.

WEDNESDAY, MAY 11

2:00 – Chapel, Baptist Church, Philharmonic Building

2:00 – The Treatment of Carcinoma of the Stomach by Total Gastrectomy—James H. Saint, M.D., Santa Barbara.

Discussion.

2:20 – Carcinoma of the Esophagus and Gastric Cardia with Special Reference to Treatment. Harold L. Thompson, M.D., Los Angeles.

Discussion.

2:40 – Cardiospasm and Megaesophagus—Gunther W. Nagel, M.D., San Francisco.

Discussion.

3:00 – The Syndrome of Proximal Jejunal Loop Obstruction Following Gastric Resection—William F. Quinn, M.D., and J. H. Gifford, M.D., Los Angeles.

Discussion.

3:20 – Treatment of Cryptorchidism—William H. Snyder, M.D., Los Angeles.

Discussion.

3:40 – The Problem of Adequate Therapy for Varicose Veins—A New Operative Procedure—Theodore B. Massell, M.D., Van Nuys.

Discussion.

4:00 – A Critique of Modern Methods of Hernia Repair with Special Reference to Cooper's Ligament—Jack M. Farris, M.D., Los Angeles.

Discussion.

4:20 – Tantalum Mesh in Operations for Recurrent and Direct Inguinal Hernia—Marcus H. Rabwin, M.D., and David H. Rosenblum, M.D., Los Angeles.

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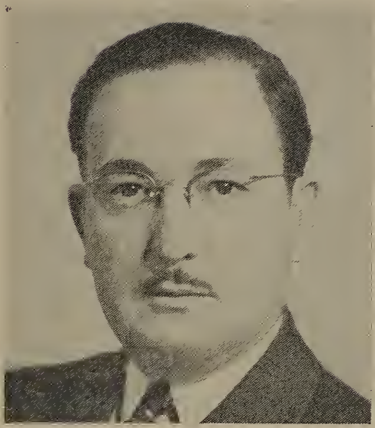
GENERAL PRACTICE

L. F. Whittaker, M.D., Huntington Beach, *Chairman*
James E. Reeves, M.D., San Diego, *Secretary*
E. R. Wilson, M.D., Red Bluff, *Assistant Secretary*



L. F. WHITTAKER
Chairman, General Practice

JAMES E. REEVES
Secretary, General Practice

SUNDAY, MAY 8

2:00 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Medicine and Allergy

For Program, see Section on General Medicine

MONDAY, MAY 9

9:30 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Surgery, General Medicine and Radiology

For Program, see Section on General Medicine

MONDAY, MAY 9

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Sections on Pediatrics and Public Health

For Program, see Section on Pediatrics

TUESDAY, MAY 10

2:00 – Chapel, Baptist Church, Philharmonic Building

2:00 – **Pediatric Emergencies**—Edwin F. Patton, M.D., Beverly Hills.

Discussion and Questions from the Floor.

2:25 – **Surgical Emergencies**—Felix Rossi, M.D., Fairfield.

Discussion and Questions from the Floor.

2:50 – **Medical Emergencies**—Willis P. Baker, M.D., Santa Ana.

Discussion and Questions from the Floor.

3:15 – **Obstetrical Emergencies**—William B. McGee, M.D., San Diego.

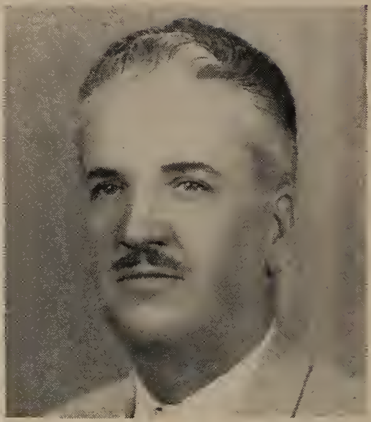
Discussion and Questions from the Floor.

3:40 – **Recess**—Annual Meeting of California Academy of General Practice.

ALLERGY

George Piness, M.D., Los Angeles, *Chairman*
Albert H. Rowe, M.D., Oakland, *Vice-Chairman*
Frank G. Crandall, Jr., M.D., *Secretary*

GEORGE PINESS
Chairman, Allergy



FRANK G. CRANDALL, JR.
Secretary, Allergy

SUNDAY, MAY 8

2:00 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Medicine and General Practice

For program, see Section on General Medicine.

MONDAY, MAY 9

2:00 – Conference Room 5, Biltmore Hotel

2:00 – **The Diagnostic Problem in Allergy—J. Harvey Black, M.D., Dallas, Texas, by invitation.**

2:40 – **Allergic Parotitis**—Ralph Bookman, M.D., Los Angeles.

2:55 – **The Non-Allergic Wheeze**—Alfred Goldman, M.D., Beverly Hills.

3:10 – **The Emotions and Bronchial Asthma**—Hyman Miller, M.D., Beverly Hills.

3:25 – **Current Methods of Administering Aminophyllin and Description of Two New Methods.** Milton Hartman, M.D., San Francisco.

3:40 – **Bronchial Asthma in Adults Between Ages of 15 and 55**—Albert H. Rowe, M.D., and Albert Rowe, Jr., M.D., Oakland.

3:55 – **Aspects of Bronchial Asthma Not Usually Recognized**—Willard S. Small, M.D., Pasadena.

4:10 – **Eczema in the Adult Patient**—Gardner S. Stout, M.D., San Francisco.

ANESTHESIOLOGY

William B. Neff, M.D., San Francisco, *Chairman*
Francis E. Guinney, M.D., Los Angeles, *Secretary*

WILLIAM B. NEFF
Chairman, Anesthesiology

FRANCIS E. GUINNEY
Secretary, Anesthesiology

SUNDAY, MAY 8

2:00 – Conference Room 5, Biltmore Hotel

2:00 – **Chairman's Address: The Paradoxical Spread of Anesthesiology in California**—William B. Neff, M.D., San Francisco.

2:30 – **Management of Anesthesia for Congenital Heart Operations in Children**—Alvin J. Harris, M.D., San Francisco.

Discussion opened by Dirk Stegeman, M.D., Los Angeles.

3:00 – **Physiology of Spinal Anesthesia**—Joseph T. Trotter, M.D., San Diego.

Discussion opened by Arthur J. Martinson, M.D., Los Angeles.

3:30 – **An Evaluation of Intrathecal Ephedrine**—Bruce M. Anderson, M.D., Oakland.

Discussion opened by Douglass H. Batten, M.D., San Diego.

4:00 – **Spinal Anesthesia with Pontocaine, Glucose and Adrenalin**—Joseph H. Failing, M.D., Los Angeles.

Discussion opened by Charles C. Wycoff, M.D., San Francisco.

TUESDAY, MAY 10

2:00 – Conference Room 5, Biltmore Hotel

2:00 – **Granuloma Following Intratracheal Anesthesia**—Simon Jesberg, M.D., Los Angeles.

Discussion opened by John Wm. Shuman, Jr., M.D., Los Angeles.

2:30 – **Anesthesia Complications During Surgery**—Sim Galinson, M.D., Los Angeles.

Discussion opened by Charles A. Foulks, Jr., M.D., Long Beach.

3:00 – **Business Meeting.**

3:30 – **Laryngospasm**—Earl T. Hull, Jr., M.D., Los Angeles.

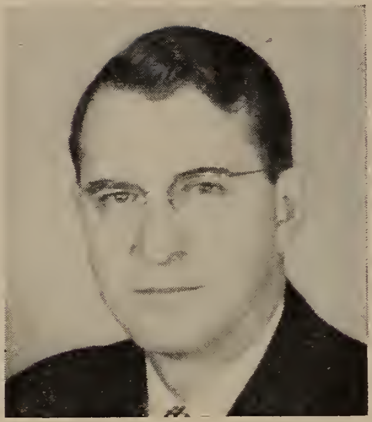
Discussion opened by William H. Moran, M.D., Los Angeles.

4:00 – **Review of Operating Room Deaths**—John B. Dillon, M.D., Los Angeles.

Discussion.

DERMATOLOGY AND SYPHILOLOGY

Herman V. Allington, M.D., Oakland, *Chairman*
Walter R. Nickel, M.D., San Diego, *Vice-Chairman*
Ervin Epstein, M.D., Oakland, *Secretary*
J. Walter Wilson, M.D., Los Angeles, *Assistant Secretary*



HERMAN V. ALLINGTON
Chairman
Dermatology and Syphilology

ERVIN EPSTEIN
Secretary
Dermatology and Syphilology

MONDAY, MAY 9

2:00 – Conference Room 1, Biltmore Hotel

Symposium

Progress in Dermatology

2:00 – Reiter's Disease—Louis H. Winer, M.D., Beverly Hills.

2:08 – Use of Newer Antibiotics in Skin Diseases—Fred G. Novy, Jr., M.D., Oakland.

2:16 – Atomic Bomb Injuries to the Skin—Verne R. Mason, M.D., Beverly Hills.

2:24 – Radioactive Isotopes in Dermatology—John Bertrand, M.D., Berkeley, by invitation.

2:32 – Radon in Skin Lesions—Bertram V. A. Low-Beer, M.D., San Francisco.

2:40 – Nitrogen Mustards in Dermatology—Norman N. Epstein, M.D., San Francisco.

2:48 – Proprietary Remedies and Cosmetics—Ralph W. Weilerstein, M.D., Federal Food and Drug Administration, San Francisco, by invitation.

2:56 – Newer Insecticides and Scabicides—C. J. Lunsford, M.D., Oakland.

3:04 – Paravertebral Injections in Herpes Zoster—Frank Anderson, M.D., Los Angeles.

3:12 – Vitamin D_2 in Dermatology—Merlin T. R. Maynard, M.D., San Jose.

3:20 – Modern Aspects of Nutrition in Dermatology. Samuel Ayres, Jr., M.D., Los Angeles.

3:28 – Antihistaminic Agents, Their Value in Dermatology—Paul D. Foster, M.D., Los Angeles.

3:36 – Newer Bases and Wetting Agents—Werner Duemling, M.D., San Diego.

3:44 – The Touch Smear Technique as an Aid in Pathologic Diagnosis—George T. Wilson, M.D., Palo Alto, by invitation.

TUESDAY, MAY 10

9:15 – Conference Room 1, Biltmore Hotel

Symposium

Dermatologic Surgery

9:15 – Correction of Advanced Rhinophyma by Means of Reconstructive Plastic Surgery—Motion Pictures in Color—Arthur E. Smith, M.D., D.D.S., Los Angeles.

9:45 – Chemosurgery in Cutaneous Malignancies—Frederic E. Mohs, M.D., Madison, Wisconsin, by invitation.

10:25 – Cold Steel Surgery in Dermatologic Lesions. H. Glenn Bell, M.D., San Francisco.

10:45 – The Relationship of Plastic Surgery to Dermatologic Practice—William S. Kiskadden, M.D., Los Angeles.

11:05 – Electrosurgery in Dermatology—Harry J. Templeton, M.D., Oakland.

11:20 – Actual Cautery Surgery in Dermatology—H. P. Jacobson, M.D., and David N. Alcon, M.D., Los Angeles.

WEDNESDAY, MAY 11

9:15 – Conference Room 1, Biltmore Hotel

9:15 – **Pinta, A Syphiloid Disease**—Paul Fasal, M.D., San Francisco.

9:30 – **Chairman's Address: Use of Liquid Nitrogen in Dermatology**—Herman V. Allington, M.D., Oakland.

9:50 – **Nail Changes Due to Nail Polish Undercoats.** Herman Sharlit, M.D., New York City, by invitation.

Discussion: Ben A. Newman, M.D., Los Angeles.

10:20 – **Hypertensive Ischemic Ulcers of the Legs**—Eugene Farber, M.D., San Francisco.

Discussion: Norman E. Freeman, M.D., San Francisco.

10:45 – **Relapsing Febrile Nodular Nonsuppurative Panniculitis (Weber-Christian Disease)** — Molleurus Couperus, M.D., Los Angeles.

Discussion: Nelson Paul Anderson, M.D., Los Angeles.

11:10 – **Business Meeting and Election of Officers.**

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EYE, EAR, NOSE AND THROAT

George L. Kilgore, M.D., San Diego, *Chairman*
George F. Keiper, Jr., M.D., Visalia, *Vice-Chairman*
Russell Fletcher, M.D., Berkeley, *Secretary*

GEORGE L. KILGORE
Chairman
Eye, Ear, Nose and Throat

RUSSELL FLETCHER
Secretary
Eye, Ear, Nose and Throat

MONDAY, MAY 9

9:30 – Chapel, Baptist Church, Philharmonic Building

9:30 – The Common Neurological Lesions in Eye, Ear, Nose and Throat Practice—Delbert Werden, M. D., San Diego.

Discussion.

10:00 – Operative Treatment of Superior Oblique Paresis—Walter L. Roberts, M.D., Los Angeles.

Discussion.

10:30 – Tumors of the Conjunctiva and Limbus—A. Ray Irvine, M.D., Los Angeles.

Discussion.

11:00 – The Preparation and Sterilization of Ophthalmic Solutions—Michael Hogan, M.D., San Francisco.

Discussion.

11:30 – A Syndrome of Stationary Localized Detached Retina—S. Rodman Irvine, M.D., Los Angeles.

Discussion.

WEDNESDAY, MAY 11

9:30 – Chapel, Baptist Church, Philharmonic Building

9:30 – The Management of Nasal Fractures—Gilbert Roberts, M.D., Pomona.

Discussion.

10:00 – Physiology and Surgery of the Nose—Anderson Hilding, M.D., Duluth, Minnesota, by invitation.

10:40 – Recent Concepts of Retarded Speech Development—Paul Moses, M.D., San Francisco.

Discussion.

11:10 – Otolaryngological Considerations of Infectious Mononucleosis—Leroy J. Barnes, M.D., Inglewood.

Discussion.

WEDNESDAY, MAY 11

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Section on Obstetrics and Gynecology, Pediatrics, and Public Health

2:00 – Tracheotomy in Acute Bulbar Poliomyelitis—Alden Miller, M.D., Los Angeles.

Discussion.

2:30 – Lung Expansion in the Newborn—Anderson Hilding, M.D., Duluth, Minnesota, by invitation.

3:00 – Intermission.

3:10 – Tonsillectomy in the Allergic Child—Benjamin F. Feingold, M.D., Los Angeles.

Discussion.

3:40 – Treatment of Otitis Media—Max E. Pohlman, M.D., Pasadena.

Discussion.

INDUSTRIAL MEDICINE AND SURGERY

Joseph D. Peluso, M.D., Los Angeles, *Chairman*
Nelson J. Howard, M.D., San Francisco, *Vice-Chairman*
Robert K. Gustafson, M.D., Pasadena, *Secretary*

JOSEPH D. PELUSO
Chairman
Industrial Medicine and Surgery

ROBERT K. GUSTAFSON
Secretary
Industrial Medicine and Surgery

SUNDAY, MAY 8

2:00 – Music Room, Biltmore Hotel

2:00 – **Proliferative Response of Joints to Trauma**—James Vernon Luck, M.D., Los Angeles.

Discussion by Ralph Soto-Hall, M.D., San Francisco, and Francis M. McKeever, M.D., Los Angeles.

2:30 – **Recent Advances in the Treatment of Diabetic Gangrene—A Motion Picture**—Walter Scott, M.D., Hollywood.

Discussion by Kendrick Smith, M.D., Los Angeles, and Nelson Howard, M.D., San Francisco.

3:00 – **Arthrotomy of the Spine**—Paul E. McMaster, M.D., Los Angeles.

Discussion by Frederick C. Bost, M.D., San Francisco, and John J. Loutzenheiser, M.D., San Francisco.

3:30 – **Fractures of the Vertebrae**—Kellogg Speed, M.D., Chicago, Illinois, by invitation.

Discussion by John C. Wilson, M.D., Los Angeles.

4:00 – **Recent Advances in the Treatment of Rheumatoid Arthritis**—Richard D. Miller, M.D., Pasadena.

Discussion by Roland A. Davison, M.D., San Francisco, and Pierre J. Walker, M.D., Los Angeles.

4:30 – **Transcervical and Intertrochanteric Fractures of the Femur**—Daniel H. Levinthal, M.D., Beverly Hills.

Discussion by Vernon P. Thompson, M.D., Los Angeles, and Alonzo J. Neufeld, M.D., Los Angeles.

TUESDAY, MAY 10

2:00 – Conference Room 8, Biltmore Hotel

2:00 – **The Use of Bone Grafts in the Treatment of Fresh Fractures of Both Bones of the Forearm**—John K. Coker, M.D., Bakersfield.

Discussion by Alvia Brockway, M.D., Los Angeles, and Richard B. McGovney, Santa Barbara.

2:30 – **Report of the Committee for Standardization of Joint Measurements in Industrial Injury Cases**—Packard Thurber, Jr., M.D., Los Angeles.

Discussion by L. I. Newman, M.D., San Francisco, and Donald Cass, M.D., Los Angeles.

3:00 – **Ruptured Intervertebral Discs of the Cervical Spine**—C. Hunter Shelden, M.D., San Marino.

Discussion by David L. Reeves, M.D., Santa Barbara, and Edwin B. Boldrey, M.D., San Francisco.

3:30 – **Fracture of the Calcaneus**—Kellogg Speed, M.D., Chicago, Illinois, by invitation.

Discussion by Joseph D. Peluso, M.D., Los Angeles.

4:00 – **The Repair of Old Injuries of the Anterior Crucial Ligament of the Knee**—John R. Vasko, M.D., Oakland.

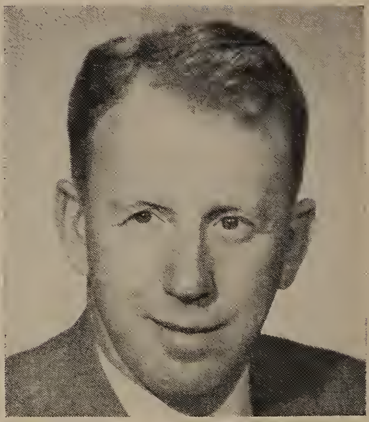
Discussion by Harold E. Crowe, M.D., Los Angeles, and Leonard B. Barnard, M.D., Oakland.

4:30 – **Business Meeting.**

NEUROPSYCHIATRY

Cullen Ward Irish, M.D., Los Angeles, *Chairman*
Henry W. Newman, M.D., San Francisco, *Secretary*

CULLEN W. IRISH
Chairman, Neuropsychiatry



HENRY W. NEWMAN
Secretary, Neuropsychiatry

SUNDAY, MAY 8

2:00 – Conference Room 4, Biltmore Hotel

2:00 – **Chairman's Address: Alcoholism: The Role of Psychiatry in Meeting the Problem**—Cullen Ward Irish, M.D., Los Angeles.

Discussion.

2:30 – **Psychosomatic or Somatopsychic?**—Arthur R. Timme, M.D., Los Angeles.

Discussion by J. M. Nielsen, M.D., Los Angeles, and Herbert I. Kupper, M.D., Beverly Hills.

3:00 – **Relationship Between Practicing Psychiatrist and Psychiatric Social Worker**—George N. Thompson, Jr., M.D., and Miss Juanita Kirkham, by invitation, Van Nuys.

Discussion by J. M. Nielsen, M.D., and Brunon Bielinski, M.D., Los Angeles.

3:30 – **Interdependent Superiority and Inferiority Feelings**—Harrington V. Ingham, M.D., Los Angeles.

Discussion by Theodore Rothman, M.D., Los Angeles, and Ralph R. Greenson, M.D., Beverly Hills.

4:00 – **A Case of Transvestitism in a Nominally Non-Homosexual Epileptic**—Robert B. Sampliner, M.D., and Seymour J. Pastron, M.D., Los Angeles.

Discussion by J. M. Nielsen, M.D., Los Angeles, and Nicholas A. Bercel, M.D., Beverly Hills.

MONDAY, MAY 9

9:30 – Conference Room 4, Biltmore Hotel

9:30 – **Business Meeting, Election of Section Officers.**

9:40 – **Encephalitic Syndrome Consequent to Multiple Miliary Embolisms of the Brain**—Edison D. Fisher, M.D., Los Angeles.

Discussion by Clarence W. Olsen, M.D., Beverly Hills, and Walter F. Schaller, M.D., San Francisco.

10:10 – **The Neurological Program of the Veterans Administration**—Walter F. Schaller, M.D., San Francisco.

Discussion by J. M. Nielsen, M.D., Los Angeles, and H. H. DeJong, M.D., Van Nuys.

10:40 – **Procaine Hydrochloride as an Excitatory and Integrative Agent in Psychiatry**—Clarence W. Olsen, M.D., Beverly Hills, and William G. Winsor, III, M.D., Los Angeles, by invitation.

Discussion by Clinton Thienes, M.D., and Karl O. von Hagen, M.D., Los Angeles.

11:10 – **Fetal Anoxia and Epilepsy**—Frederick A. Fender, M.D., San Francisco.

Discussion by J. M. Nielsen, M.D., and Cyril B. Courville, M.D., Los Angeles.

11:40 – **The Treatment of Typical Migraine with Dehydrated Ergot Derivatives**—Nicholas A. Bercel, M.D., Beverly Hills.

Discussion by John D. Moriarity, M.D., Los Angeles, and Robert B. Aird, M.D., San Francisco.

OBSTETRICS AND GYNECOLOGY

A. M. McCausland, M.D., Los Angeles, *Chairman*
Donald A. Dallas, M.D., San Francisco, *Vice-Chairman*
Leon Krohn, M.D., Los Angeles, *Secretary*

A. M. McCAUSLAND
Chairman
Obstetrics and Gynecology

LEON KROHN
Secretary
Obstetrics and Gynecology

SUNDAY, MAY 8

2:00 – Conference Room 1, Biltmore Hotel

Symposium

"Rooming-in" Plan for Mothers and Infants

Moderator: Philip A. Reynolds, M.D., Los Angeles

2:00 – **Obstetrician's Point of View**—Philip A. Reynolds, M.D., Los Angeles.
Discussion.

2:20 – **Pediatrician's Point of View**—Robert G. Shirley, M.D., Beverly Hills.
Discussion.

2:40 – **Nursing Point of View**—Margaret McGuirk, R.N., North Hollywood, by invitation.
Discussion.

3:00 – **Psychiatrist's Point of View**—Norman A. Levy, M.D., Los Angeles.
Discussion.

MONDAY, MAY 9

9:30 – Conference Room 1, Biltmore Hotel

Symposium

Medicolegal Aspects of Obstetrical and Gynecological Problems

Chairman: A. M. McCausland, M.D., Los Angeles

9:30 – **Sterilization**—Emil J. Krahulik, M.D., Los Angeles.

9:45 – **Adoptions**—Donald G. Tollefson, M.D., Los Angeles.

10:00 – **Abortions**—Karl L. Schaupp, Sr., M.D., San Francisco.

10:15 – **Artificial Insemination**—John O. Haman, M.D., San Francisco.

10:30 – **Summary—Legal Aspects**—Louis J. Regan, M.D., LL.B., Los Angeles.

10:45 – **Discussion**—To be opened by William Benbow Thompson, M.D., Los Angeles.

TUESDAY, MAY 10

2:00 – Conference Room 1, Biltmore Hotel

2:00 – **Business Session.**

2:20 – **Chairman's Address: The Effect of Cord and Placental Blood on the Infant**—A. M. McCausland, M.D., Los Angeles.

2:40 – **The Usefulness of the Vaginal Smear**—Milton Rosenthal, M.D., San Francisco, by invitation.
Discussion—Virgil O. Parrett, M.D., Napa.

3:05 – **Endometriosis**—Woodburn K. Lamb, M.D., Berkeley.
Discussion—Henry N. Shaw, M.D., Los Angeles.

3:30 – **The Physiology and Management of the Climacteric**—Gertrude F. Jones, M.D., San Francisco.
Discussion—John C. McDermott, M.D., Los Angeles.

WEDNESDAY, MAY 11

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Sections on Eye, Ear, Nose and Throat, Pediatrics and Public Health

For Program, see Section on Eye, Ear, Nose and Throat

PATHOLOGY AND BACTERIOLOGY

Gerson R. Biskind, M.D., San Francisco, *Chairman*
C. S. Small, M.D., Loma Linda, *Secretary*
Warren Bostick, M.D., San Francisco, *Assistant Secretary*

GERSON R. BISKIND
Chairman
Pathology and Bacteriology

C. S. SMALL
Secretary
Pathology and Bacteriology

SUNDAY, MAY 8

2:00 – Conference Room 8, Biltmore Hotel

2:00 – **Iodized-Poppy-Seed-Oil Granuloma**—Harry C. Fortner, M.D., Sherman Oaks.

Discussion opened by Emil Bogen, M.D., Olive View.

2:25 – **Fat Embolism Following Arthroclasia**—Howard J. Gomes, M.D., Los Angeles, by invitation.

Discussion opened by Albert F. Brown, M.D., Glendale.

2:50 – **Epithelial Tumors of the Bronchi**—Irving Reingold, M.D., by invitation, Richard E. Ottoman, M.D., by invitation, and R. E. Konwaler, M.D., by invitation, Van Nuys.

Discussion opened by Perry J. Melnick, M.D., Van Nuys.

3:15 – **The Pathologist and Pathology in the Cancer Program**—William O. Russell, M.D., Houston, Texas, by invitation.

Discussion by David Wood, M.D., San Francisco, and Alvin Foord, M.D., Pasadena.

3:40 – Recess—Annual Meeting of California Society of Pathologists.

MONDAY, MAY 9

9:30 – Conference Room 8, Biltmore Hotel

9:30 – **Acute Filarial Lymphangitis—A Review and Summary**—Robert W. Huntington, Jr., M.D., Los Angeles.

Discussion opened by Gilbert Curtis, M.D., Glendale.

9:55 – **The Pathology of Ochronosis**—Leo J. Kaplan, M.D., Sawtelle, by invitation.

Discussion opened by Gerson Biskind, M.D., San Francisco.

10:20 – **The Aortic Hypoplasia**—Bartlett C. Shackford, M.D., Long Beach.

Discussion.

10:45 – **Thrombosis of Renal Veins**—Albert E. Hirst, M.D., and Hugh A. Edmondson, M.D., Los Angeles.

Discussion opened by Arthur Lack, M.D., Van Nuys.

11:10 – **The Pathogenesis of Platelet Thrombosis**—Nathan B. Friedman, M.D., Los Angeles.

Discussion opened by Gurth Carpenter, M.D., Beverly Hills.

MONDAY, MAY 9

2:00 – Conference Room 8, Biltmore Hotel

2:00 – **Morphologic Changes in Mammary Cancer Following Hormone Therapy**—Ian Macdonald, M.D., Los Angeles.

Discussion.

2:30 – **Clinical and Pathologic Features of Endometriosis — A Study of 100 Cases** — D. A. De Santo, M.D., San Diego.

Discussion.

3:00 – **Chairman's Address: The Clinical Significance of Urinary Ketosteroid Assays**—Gerson R. Biskind, M.D., San Francisco.

3:30 – **Business Meeting and Election of Officers.**

PEDIATRICS

Alice Potter, M.D., San Francisco, *Chairman*
Carl A. Erickson, M.D., Pasadena, *Secretary*
Richard D. Cutter, M.D., Palo Alto, *Assistant Secretary*

ALICE POTTER
Chairman, Pediatrics

CARL A. ERICKSON
Secretary, Pediatrics

MONDAY, MAY 9

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Sections on General Practice and Public Health

Panel Discussion

What's New in Pediatrics

Moderator: Robert S. Cleland, M.D., San Marino

2:00 – **Treatment of Erythroblastosis**—Clement Molony, M.D., Beverly Hills.

2:10 – **Laboratory Determination and Clinical Significance of Various Rh Types of Antibodies**—Gilbert Jorgensen, M.D., Los Angeles.

2:20 – **Paroxysmal Tachycardia in Infancy**—Eugene Levine, M.D., Los Angeles.

2:30 – **Rheumatic Fever**—Robert Shirley, M.D., Beverly Hills.

2:40 – **Congenital Heart Disease**—Charles Baker, M.D., Los Angeles, by invitation.

2:50 – **Contagious Diseases**—Evelynne Knouf, M.D., Pasadena.

3:00 – **Recess.**

3:20 – **Treatment of Leukemia**—Edward Evans, M.D., Pasadena, by invitation.

3:30 – **Immunization**—Milo Brooks, M.D., Los Angeles.

3:40 – **Q Fever**—Deron Hovsepian, M.D., Pasadena, by invitation.

3:50 – **B.C.G.**—Jacob Yerushalmy, Ph.D., Berkeley, by invitation, and Carroll E. Palmer, M.D., Washington, D.C., by invitation.

4:00 – **Questions in writing to be passed to Moderator, who will distribute to members of the Panel.**

TUESDAY, MAY 10

2:00 – Baptist Church, Philharmonic Building

2:00 – **Indications for, and Results of Lobectomies in Children**—John C. Jones, M.D., Los Angeles.

Discussion—Don Shelby, M.D., Los Angeles.

2:30 – **Treatment of Miliary and Meningeal Tuberculosis in Infants and Children**—Thomas L. Perry, M.D., Los Angeles, by invitation.

Discussion—Wendel Redfern, M.D., Glendale.

3:00 – **Recess.**

3:10 – **Anoxia in the Newborn**—Martin Gershman, M.D., San Francisco.

Discussion by Margaret Jones, M.D., Los Angeles.

3:40 – **Lipoid Storage Disease**—Ralph E. Knutti, M.D., Los Angeles.

Discussion—Phillip Sturgeon, M.D., Los Angeles.

4:10 – **Premature Care**—Alonzo B. Cass, M.D., Los Angeles.

Discussion—J. Parmelee, Los Angeles.

4:40 – **Business Meeting.**

WEDNESDAY, MAY 11

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Sections on Eye, Ear, Nose and Throat, Obstetrics and Gynecology, and Public Health

For Program, see Section on Eye, Ear, Nose and Throat

PUBLIC HEALTH

Malcolm H. Merrill, M.D., Berkeley, *Chairman*
Edward Lee Russell, M.D., Santa Ana, *Vice-Chairman*
Martin Mills, M.D., Richmond, *Secretary*

MALCOLM H. MERRILL
Chairman, Public Health

MARTIN MILLS
Secretary, Public Health

SUNDAY, MAY 8

Conference Room 9, Biltmore Hotel

2:00 – **Chairman's Address: Recent Trends in Public Health—Malcolm H. Merrill, M.D., Berkeley.**

2:20 – **Multiphasic Survey—Mass Screening for Several Diseases Among 1,000 Industrial Employees in San Jose, California**—C. Kelly Canelo, M.D., Dwight M. Bissell, M.D., San Jose, Herbert K. Abrams, M.D., by invitation, and Lester Breslow, M.D., San Francisco.

Discussion: Roy O. Gilbert, M.D., Los Angeles, and Dwight M. Bissell, M.D., San Jose.

3:05 – **Business Recess. Election of Officers.**

3:25 – **A Coordinated Tuberculosis Control Program.** Edward L. Russell, M.D., Santa Ana, and Erwin P. Brauner, M.D., Richmond.

Discussion: Edward Kupka, M.D., San Francisco.

3:55 – **Public Health Aspects of Lymphopathia Venereum**—Richard Koch, M.D., San Francisco.

Discussion—A. Frank Brewer, M.D., and Paul Fasal, M.D., San Francisco.

MONDAY, MAY 9

2:00 – Baptist Church, Philharmonic Building

Joint Meeting with Sections on Pediatrics and General Practice

For Program, see Section on Pediatrics

TUESDAY, MAY 10

2:00 – Conference Room 9, Biltmore Hotel

2:00 – **Coccidioidal Meningitis**—William Buss, M.D., Bakersfield.

Discussion—Robert Cohen, M.D., and Myrnie Gifford, M.D., Bakersfield.

2:35 – **Epidemiologic Study of Poliomyelitis in San Diego in 1948**—Henrik L. Blum, M.D., San Diego, by invitation.

Discussion—K. H. Sutherland, M.D., Los Angeles.

3:05 – **Mental and Emotional Factors Affecting a Diphtheria Immunization Program**—Hubert O. Swarthout, M.D., San Luis Obispo.

Discussion.

3:35 – **Diarrhea of the Newborn: Review of the Literature**—Lester S. McLean, M.D., Vallejo.

Discussion.

WEDNESDAY, MAY 11

2:00 – Chapel, Baptist Church, Philharmonic Building

Joint Meeting with Sections on Eye, Ear, Nose and Throat, Obstetrics and Gynecology, and Pediatrics

For Program, see Section on Eye, Ear, Nose and Throat

RADIOLOGY

Albert K. Merchant, M.D., Stockton, *Chairman*
Sydney F. Thomas, M.D., Palo Alto, *Secretary*

ALBERT K. MERCHANT
Chairman, Radiology

SYDNEY F. THOMAS
Secretary, Radiology

SUNDAY, MAY 8

2:00 – Conference Room 2, Biltmore Hotel

Joint Meeting with Section on Urology

2:00 – **X-ray Appearance of Central Fat Tissue: Significance in Urography**—Frank Windholz, M.D., San Francisco.

Discussion.

2:30 – **Osteitis Pubis**—Carleton C. Wright, M.D., and Edward W. Beach, M.D., Sacramento.

Discussion.

3:00 – **Displacements of the Ureter**—Roy B. Weathered, Los Angeles.

Discussion.

3:30 – **Space-Occupying Lesions of the Kidney**—Sydney F. Thomas, M.D., Palo Alto.

Discussion.

MONDAY, MAY 9

9:30 – Ballroom, Biltmore Hotel

Joint Meeting with Sections on General Medicine, General Surgery, and General Practice

For program, see Section on General Medicine.

MONDAY, MAY 9

1:30 – Conference Room 4, Biltmore Hotel

1:30 – **Business Meeting and Election of Officers.**

2:00 – **Deep Roentgen Therapy to the Nasopharynx.** Harold R. Morris, M.D., Redlands.

Discussion.

2:30 – **Carcinoma of Cervix Uteri**—Grant Beckstrand, M.D., Long Beach.

Discussion.

3:00 – **Radiation versus Surgery for Cancer of the Tongue**—George S. Sharp, M.D., and Eugene Demaree, M.D., Pasadena.

Discussion.

3:30 – **Benign Tumors of the Gastro-Intestinal Tract.** Marshall B. Tucker, M.D., Oakland.

Discussion.

4:00 – **Recess**—Annual Meeting of Pacific Roentgen Society.

UROLOGY

Frederick A. Bennetts, M.D., Los Angeles, *Chairman*
Arthur B. Cecil, M.D., Los Angeles, *Vice-Chairman*
James Ownby, Jr., M.D., San Francisco, *Secretary*

FREDERICK A. BENNETTS
Chairman, Urology

JAMES OWNBY, JR.
Secretary, Urology

SUNDAY, MAY 9

2:00 – Conference Room 2, Biltmore Hotel

Joint Meeting with Section on Radiology

For Program, see Section on Radiology.

MONDAY, MAY 9

9:00 – Conference Room 9, Biltmore Hotel

9:00 – **The Technique of Transurethral Surgery—A Motion Picture in Color—Robert J. Prentiss, M.D., San Diego, and R. G. Bunge, M.D., Iowa City, Iowa, by invitation.**

9:30 – **Experience with Transurethral Prostatectomies—Ralph B. Mullenix, M.D., Robert J. Prentiss, M.D., and Robert E. DeLaval, M.D., San Diego.**

Discussion opened by James L. MacDonald, M.D., Oakland.

10:00 – **Some Aspects of Calculus Disease of the Kidney—R. H. Flocks, M.D., Iowa City, Iowa, by invitation.**

Discussion opened by James R. Dillon, M.D., San Francisco.

11:00 – **Business Meeting.**

WEDNESDAY, MAY 11

2:00 – Conference Room 9, Biltmore Hotel

2:00 – **Chairman's Address: Solitary Renal Cyst, A Clinical Syndrome—Frederick A. Bennetts, M.D., Los Angeles.**

2:30 – **Advanced Urological Disease in the Presence of Normal Urine—Donald W. Atcheson, M.D., Riverside.**

Discussion opened by Frank Hinman, Jr., M.D., San Francisco.

3:00 – **Hydrocalycosis of a Single Renal Calyx in the Newborn Infant with Complete Destruction of the Kidney—Henry M. Weyrauch, M.D., San Francisco, and Albert E. Fleming, M.D., San Francisco, by invitation.**

Discussion opened by John W. Dorsey, M.D., Long Beach.

3:30 – **Partial Resection of the Kidney for Renal Calculi—Morton M. Mayers, M.D., Los Angeles.**

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C. M. A. Cancer Commission Pre-Convention Conference

BILTMORE HOTEL, LOS ANGELES
SATURDAY, MAY 7

The preconvention conferences sponsored by the Cancer Commission will be held at the Biltmore Hotel on Saturday, May 7, the day preceding the opening of the California Medical Association meeting.

PATHOLOGY

PATHOLOGY—Conference Room 1, Biltmore Hotel

The preconvention conference on Microscopic Tumor Pathology will be held from 10:00 a.m. to 12 noon and from 2:00 p.m. to 5:00 p.m., under the chairmanship of Dr. Edward Butt, Los Angeles. Dr. N. Chandler Foot, professor of surgical pathology, Cornell University, will be the moderator. Tumor diagnostic problems will be presented and discussed. Members who attend this conference are requested to bring their own microscopes and to register now with Dr. John Budd, 1407 South Hope Street, Los Angeles 15.

RADIOLOGY

RADIOLOGY—Conference Room 2, Biltmore Hotel

The preconvention conference on Radiology will be held from 10:00 a.m. to 12 noon and from 2:00 p.m. to 5:00 p.m., under the chairmanship of Dr. Sidney Mesirow, Beverly Hills. Dr. Wybren Hiemstra of Los Angeles is secretary.

GENERAL MEETING

GENERAL CONFERENCE FOR PRIVATE PRACTITIONERS AND MEMBERS OF CANCER COMMITTEES—Conference Room 4, Biltmore Hotel

Presiding: J. Homer Woolsey, M.D., vice-chairman, Cancer Commission

2:00 – Delay as the Cause of Cancer Mortality — A Round Table Symposium Featuring the Examination, Diagnosis and Treatment of Early Cancer.

3:30 – The Cancer Committee of the County Medical Society and the Cancer Control Program.

1. A Report of the California Division of the American Cancer Society—Mr. Leonard V. Griffith, executive vice-president.
2. Report of the Cancer Commission—David A. Wood, M.D., secretary.
3. Round Table Discussion of the Functions of the Cancer Committees.

EVENING CONFERENCE

The Cancer Commission Dinner will be held at 6:30 p.m. at the Biltmore Hotel, Conference Room 1, for members of the Cancer Committees of the County Medical Societies. Dr. John Cline, presiding. Interested physicians are invited. Make reservations with Dr. E. Eric Larson, 1930 Wilshire Boulevard, Los Angeles, or Dr. David Wood, 54 Commonwealth Avenue, San Francisco. $5.00 per plate.

A report of the cancer control activities of the California Department of Public Health will be given by Dr. Lester Breslow.

Immediately following the dinner there will be a Panel Discussion on Early Cancer of the Breast. Dr. Alson Kilgore will be the moderator. The panel will consist of Dr. Ian Macdonald, assistant professor of surgery, University of Southern California; Dr. Nathan A. Womack, professor of surgery, University of Iowa; and Dr. Lyell C. Kinney, chairman, Cancer Commission, San Diego.

SCIENTIFIC SESSIONS

	SUNDAY MAY 8		MONDAY MAY 9		TUESDAY MAY 10		WEDNESDAY MAY 11	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
BILTMORE THEATER						2:00 General Surgery		
BILTMORE HOTEL Ballroom	10:00 General Meeting	1:30 General Medicine General Practice Allergy	9:00 General Medicine General Surgery General Practice Radiology		9:10 General Meeting and Clinical Pathological Conference	1:30 General Medicine	9:30 General Meeting "What's New"	1:00 General Medicine
Biltmore Bowl		2:00 General Surgery						
Music Room		2:00 Industrial Medicine and Surgery						
Conference Room 1		2:00 Obstetrics and Gynecology	9:30 Obstetrics and Gynecology	2:00 Dermatology and Syphilology	9:15 Dermatology and Syphilology	2:00 Obstetrics and Gynecology	9:15 Dermatology and Syphilology	
Conference Room 2		2:00 Radiology and Urology						
Conference Room 4		2:00 Neuropsychiatry	9:30 Neuropsychiatry	2:00 Radiology				
Conference Room 5		2:00 Anesthesiology		2:00 Allergy		2:00 Anesthesiology		
Conference Room 8		2:00 Pathology and Bacteriology	9:30 Pathology and Bacteriology	2:00 Pathology and Bacteriology		2:00 Industrial Medicine and Surgery		
Conference Room 9		2:00 Public Health	9:00 Urology			2:00 Public Health		2:00 Urology
BAPTIST CHURCH 2nd Floor Philharmonic Building, Fifth and Olive Streets				2:00 Pediatrics General Practice Public Health		2:00 Pediatrics		2:00 Eye, Ear, Nose and Throat; Obstetrics and Gynecology Pediatrics Public Health
CHAPEL BAPTIST CHURCH 2nd Floor			9:30 Eye, Ear, Nose and Throat			2:00 General Practice	9:30 Eye, Ear, Nose and Throat	2:00 General Surgery
Music Room Biltmore		4:30 **House of Delegates**				4:30 **House of Delegates**		

COUNCIL OF THE C.M.A. MEETS DAILY AT 7:30 A.M. IN CONFERENCE ROOM 6, BILTMORE HOTEL

SCIENTIFIC EXHIBITS—CONFERENCE ROOM 7, BILTMORE HOTEL

MEDICAL MOTION PICTURES—GALERIA ROOM, BILTMORE HOTEL

WOMAN'S AUXILIARY

TO THE

CALIFORNIA MEDICAL ASSOCIATION

NINETEENTH ANNUAL CONVENTION

Headquarters, Biltmore Hotel • Los Angeles, California

MRS. LAWRENCE K. GUNDRUM
President

MRS. RAYMOND T. WAYLAND
President-Elect

Convention Chairman, Mrs. Newell Jones

REGISTRATION

Sunday, May 8, 9 a.m.-12 noon, 3-6 p.m.
Monday, May 9, 9 a.m.-5 p.m.
Tuesday, May 10, 9 a.m.-12 noon

SUNDAY, MAY 8

8:00 a.m.—Executive Committee Meeting—President's Room.

10:00 a.m.—Opening Session of the California Medical Association. Report of year's work by the President of the Auxiliary. All Auxiliary members and Doctors' wives are invited to attend.

10:00 a.m.—Pre-Convention Board Meeting—Conference Room 8, Biltmore Hotel.

MONDAY, MAY 9

9:30 a.m.—First Session of the Nineteenth Annual Convention—Burdette Hall, Second Floor, 427 West Fifth Street.

12:30 p.m.—Luncheon honoring the State President, the President-Elect and Past State President, members of the Advisory Board — Biltmore Bowl, Biltmore Hotel.

7:30 p.m.—California Medical Association Annual Dinner honoring the President.

TUESDAY, MAY 10

9:30 a.m.—Second Session of the Nineteenth Annual Convention—Burdette Hall, Second Floor, 427 West Fifth Street.

12:00 noon-12:30 p.m.—School of Instruction for County Presidents, Officers and Committee Chairmen.

12:30-1:30 p.m.—Post-Convention Board Meeting.

3:00-6:00 p.m.—Party honoring the wife of the President of the California Medical Association —Conference Rooms 2 and 3, Biltmore Hotel.

Technical Exhibits

The Association is fortunate in having a well-rounded technical exhibit to offer those attending the 1949 Annual Session. Exhibits will be found in the Ballroom Foyer and the Renaissance Room, located at either end of the Galeria floor of the Biltmore Hotel.

Members are reminded that the technical exhibitors pay the Association for the privilege of participating in the exhibit and that the funds from this source are entirely applied to the cost of the meeting. This makes it possible for the Association to conduct a large Annual Session without the need of charging a registration fee or increasing your dues to cover the expense.

You may show your appreciation of this valuable contribution by attending the exhibits, visiting and registering with the exhibitors and letting them know they are more than welcome at the meeting. From the scientific point of view, the exhibitors will have on display the latest in therapeutic and diagnostic agents, a display which is not possible to find similarly assembled except at a meeting of this type.

All exhibitors are listed below, with their locations. On the following pages is an alphabetical listing which gives a brief description of the products and services displayed for your information and convenience.

About the Exhibitors

ABBOTT LABORATORIES **Renaissance Room**
North Chicago, Illinois

Abbott Laboratories will feature Pentothal.

A. S. ALOE COMPANY **Ballroom Foyer**
Los Angeles

A. S. Aloe Company will exhibit surgical, laboratory and physiotherapy equipment, of its own manufacture, and a complete line of national standard lines of doctors' accessories.

AMES COMPANY, Inc. **Renaissance Room**
Elkhart, Indiana

Ames Company representatives will be glad to discuss Decholin, the standard hydrocholeretic agent for the treatment of biliary tract diseases, and Decholin Sodium, pure sodium dehydrocholate.

They will be demonstrating Clinitest and Hematest—simplified tests for the detection of urine-sugar and occult blood.

AYERST, McKENNA & HARRISON, Ltd.
New York, New York **Renaissance Room**

Premarin (Estrogenic Substances — water-soluble) — a highly effective and well-tolerated preparation of naturally-occurring, orally-active, conjugated estrogens (equine). The potency of Premarin is expressed in terms of its principal estrogen, sodium estrone sulfate.

Premarin provides convenience of administration and flexibility of dosage. Four potencies of Premarin Tablets are available. Premarin is also presented in liquid form.

THE BAKER LABORATORIES, Inc.
Cleveland, Ohio **Ballroom Foyer**

The Baker display is built around the six-step approach to optimum infant nutrition which leads to the picture of the happy mother and the healthy child. An adjusted protein, two carbohydrates, a modified fat, vitamins, soluble mineral salts and iron, coupled with simplicity of preparation and low cost, provide for complete nutrition and insure cooperation in the home. Baker's Modified Milk, liquid or powder, may be used interchangeably from birth to the end of the bottle-feeding period. May we discuss your infant feeding problem with you?

BARNES-HIND LABORATORIES, Inc.
San Francisco **Galeria Room**

We cordially invite you to visit our exhibit located in the Galeria Room during the convention. The exhibit is featuring the comparative absorption, excretion and storage of oily and water dispersible vitamin A.

DON BAXTER, Inc. **Renaissance Room**
Glendale

Featured in the Don Baxter exhibit will be the completely new, expendable blood and plasma administration set with a long, slotted strainer which pre-filters within the container and eliminates troublesome clogging, heretofore a major factor causing critical delays in blood administration.

Of particular interest will be the new, expendable plastic stomach and gastro-intestinal tubes for intranasal intubation. The smooth plastic material assures greater patient comfort and cooperation.

M. J. BENJAMIN **Renaissance Room**
Los Angeles

A representative assortment of special appliances for orthopedic work will be shown as space permits.

Other types will be shown and discussed upon request.

Also shown will be the Springalumin Truss which has been developed to a very successful state for individual hernia problems.

M. J. Benjamin carries 57 models of S. H. Camp & Company Surgical Supporters. The most representative stock to be found in this area.

BILHUBER-KNOLL CORP. **Renaissance Room**
Orange, New Jersey

The fine medicinal chemicals, Bromural, Dilaudid, Metrazol, Octin, Theocalcin, etc., which fill an important place in the physician's armamentarium of dependable and useful medication, are found at the Bilhuber-Knoll Booth No. 52. These prescription chemicals are adaptable for prescribing alone or in combinations to meet the needs of the individual patient.

Visit their exhibit for the latest developments among these and their other products.

THE BORDEN COMPANY **Renaissance Room**
New York, New York

A new improved better than ever Biolac is presented in Booth No. 40—better nutritionally and better physically. Unchanged are the dilutions, analysis, caloric values, vitamin fortification, and ease of feeding. This new improved Biolac, a liquid modified milk for infant feeding, brings to you the latest findings of nutritional science . . . at no increase in cost.

Likewise exhibited will be our long-established products, Mull-Soy, Dryco, Beta Lactose, Gerilac, Klim and Merrell-Soule special milks.

BRISTOL LABORATORIES, Inc.

Syracuse, New York **Renaissance Room**

Bristol Laboratories exhibit will be devoted to the display of many of its antibiotic and pharmaceutical products. Some of our products on display will be: *Flo-Cillin* "96," the original Procaine Penicillin G in Oil with Aluminum Monostearate; *Streptomycin Ointment*, the first ointment of this type to be put on the market; *Vytinic*, a highly palatable liquid hematinic with Folic Acid; *Soluble Penicillin Tablets.*

Qualified representatives will be on hand to answer questions and to give you samples and literature.

A. M. BROOKS COMPANY **Galeria Room**

Los Angeles

We extend a cordial invitation to you to stop at our booth for examination and demonstration of the Raytheon Microtherm, microwave, (radar) diathermy. See for yourself the most outstanding development in diathermy today. Also featuring ADC Audiometers with the latest contribution to the field of scientific hearing testing. Brooks Thermosine—Sine-galvanic—Ultraviolet lamps. Capable representatives will be on hand at all times to answer questions on above equipment.

BURROUGHS WELLCOME & COMPANY

Tuckahoe, New York **Ballroom Foyer**

Among significant products featured will be 'Wellcome' brand Globin Insulin with Zinc 'B. W. & Co.,' which provides an action which is timed to be more suitable for the average diabetic; 'Dexin' brand High Dextrin Carbohydrate, in which the non-fermentable proportion predominates; Digoxin, the pure, stable, crystalline glycoside which offers predictable digitalization; and 'Methedrine,' a recent sympathomimetic drug of wide therapeutic application.

CAMEL CIGARETTES **Ballroom Foyer**

New York, New York

Camel Cigarettes will exhibit a large detailed photograph showing the calculated absorption of nicotine from cigarette smoke in the human respiratory tract. Representatives will be on hand to discuss any phase of the physiological effects of smoking.

CAMERON SURGICAL SPECIALTY COMPANY

Chicago **Ballroom Foyer**

See the new Rado-Gap Cauterodynes with Spark-Gap, Radio-Frequency and Blended Circuits, the Cauteradio and other Units and Accessories for all phases of Electro-Surgery, Electro-Cauterization, Electro-Coagulation, Desiccation and Fulguration; Electro-Diagnostic Lamp and Instrument Outfits; the new stainless steel Boros Flexible Esophagoscope and Broncho-Esophago-Laryngoscopic Sets; Coagulair Sigmoidoscope; Tele-Vaginalite; Mirrolite and other Headlites; Binocular Loupes; Illuminated Specula, Endoscopes, Retractors and other Instruments for all types of Diagnosis, Treatment and Surgery.

CARNATION COMPANY **Renaissance Room**

Los Angeles

You are invited to visit Booth No. 54 where you will see an attractive display on Carnation Evaporated Milk—"the milk every doctor knows." Some valuable information on the use of this milk for infant feeding, child feeding, and general diet will be presented and the method by which Carnation is generously fortified with pure crystalline Vitamin D—400 U.S.P. units per reconstituted quart—will be explained. Interesting literature will also be available for distribution.

CIBA PHARMACEUTICAL PRODUCTS, Inc.

Summit, New Jersey **Ballroom Foyer**

Ciba Pharmaceutical Products, Inc., Summit, New Jersey, Booth No. 7, invite you to visit their exhibit for latest information on *Priscol*, a valuable adjunct to the treatment of peripheral vascular disease. *Pyribenzamine HCl*, the antihistaminic drug for prevention and relief of anaphylaxis and many forms of allergy, will also be featured.

Representatives in attendance will gladly answer any questions about these and other Ciba products.

COCA-COLA COMPANY **Galeria Room**

Atlanta, Georgia

Ice-cold Coca-Cola will be served the delegates through the joint cooperation and courtesy of The Coca-Cola Bottling Company of California, Los Angeles, and The Coca-Cola Company.

COMMERCIAL SOLVENTS CORPORATION

New York, New York **Renaissance Room**

CSC Pharmaceuticals will exhibit, in addition to its complete line of penicillin products, several new pharmaceuticals. Foremost among these is Bacitracin, a new antibiotic recently introduced by CSC, in the form of ointment, ophthalmic ointment, and in vials, and tablets. Inositol and Syrup Choline Bicarbonate will be included in the exhibit, as well as Kwell Ointment.

THE CONTINENTAL MEDICAL BUREAU

Los Angeles **Renaissance Room**

The Continental Medical Bureau, Agency, of Los Angeles (Helen Buchan, Director) will have representatives in Booth No. 34.

Complete service is offered to the medical profession. A physicians-surgeons registry lists California Licensed physicians seeking new locations as well as groups and established men interested in contacting associate doctors. Hospital personnel and doctors' office personnel registered; files available for your review.

Our real estate and business department offers for sale or lease hospitals, clinic buildings, office-residence combinations and established practices.

No registration fee—no obligation unless we produce results. Stop at Booth No. 34 and discuss our services.

CUTTER LABORATORIES **Renaissance Room**

Berkeley

The Cutter Laboratories exhibit in Space No. 31 will have as its center an unusual mechanical book display. We will feature our complete line of pediatric products including triple immunizing vaccine Dip-Pert-Tet, Plain and Aluminum Hydroxide Absorbed; Blood Fractions, including Immune Serum Globulin for measles modification, Albumin and Hypertussis; and Intravenous Solutions and Saftiflasks. Won't you stop in and see us?

F. A. DAVIS COMPANY **Renaissance Room**

Philadelphia, Pennsylvania

These and other new books and new editions may be examined at Booth No. 35: *Pain Syndromes*—Judovich and Bates; *Clinical Neurology*—Alpers; *Medical Diagnosis*—Loewenberg; *Treatment in General Medicine*—Reimann; *Cardiovascular Disease*—Stroud; *Clinical Cystoscopy*—McCrea; *Peripheral Vascular Diseases*—Kramer; *Clinical Tuberculosis*—Goldberg; *Arthritis*—Bach; *Handbook of Treatment*—Gruber; *Dermatology*—Greenbaum; *Cyclopedia of Medicine, Surgery and Specialties*—Piersol and Bortz; *Clinical Radiology*—Pillmore; *Diseases of the Gallbladder—Behrend; Pediatric Therapeutics*—Litchfield-Dembo; *Romance of Medicine* and *Medicine Throughout Antiquity*—Gordon; *Pediatric Progress*—Litchfield-Dembo; *Internal Diseases of the Eye*—Troncoso; *Cyclopedic Medical Dictionary*—Taber; *Proctology in General Practice*—Smith.

DESITIN CHEMICAL COMPANY **Galeria Room**
Providence, Rhode Island

Desitin Ointment, the pioneer in external cod-liver-oil therapy combines crude high potency Norwegian cod-liver-oil, zinc oxide and talcum in a lanolin petrolatum base. Owing to its content of a balanced and standardized crude cod-liver-oil, Desitin Ointment alleviates pain and relieves itching promptly. It promotes granulation and epitheliazation. Desitin Ointment is not liquefied under body temperature nor decomposed by secretion, forming therefore a perfect protection for the skin. Indications: Postoperative dressings, slow-healing wounds; indolent varicose chronic ulcers, burns of all degrees; lacerations; bed sores; hemorrhoids and fissures.

Desitin Powder: A unique medicinal toilet powder. It contains crude cod-liver-oil, zinc oxide, magnesium oxide and talcum. Use as Desitin Ointment.

THE DOHO CHEMICAL CORPORATION
New York, New York **Galeria Room**

The makers of Auralgan are featuring at this meeting, their new Sulfa preparation, O-Tos-Mo-San, indicated in the treatment and control of chronic suppurative ears. Our representatives will be happy to explain in detail the workings of these medications.

Also, to distribute hospital aural instruction charts and other charts of the anatomical and pathological diseases of the ear.

DRUG SPECIALTIES, Inc. **Galeria Room**
Los Angeles

We plan to display and sample the following products and have medical literature available on them: *Levo Bel:* A pure levorotatory Belladonna alkaloids for use as an antispasmodic in vagus hypertension. *Hematinic F:* Iron-Liver combination with folic acid. *Sulfa Mulsion:* Micro suspension of three sulfonamides in a pleasant vehicle.

EATON LABORATORIES, Inc. **Renaissance Room**
Norwich, New York

The following Council-accepted Eaton specialties will be exhibited: Furacin Soluble Dressing—a topical antibacterial agent (nitrofurazone N.N.R.) with a wide antibacterial spectrum, in a water-soluble ointment-like base. Furacin Solution—for use when a liquid vehicle is more convenient. Lorophyn Suppositories and Lorophyn Jelly—for conception control when pregnancy is contraindicated. Aspogen—an amino acid-basic aluminum salt (dihydroxy aluminum aminoacetate N.N.R.) for use in the treatment of peptic ulcer and hyperchlorhydria.

ENDO PRODUCTS, Inc. **Galeria Room**
Richmond Hill, New York

The Endo exhibit will feature A.M.A. Council accepted products, such as *Hycodan, Norodin, Mesopin,* etc. Many of our products will be sampled to our many friends in the medical profession.

C. B. FLEET COMPANY, Inc. **Ballroom Foyer**
Lynchburg, Virginia

C. B. Fleet Co., Inc., cordially invites you to stop by Booth No. 1 for a short visit with the three California representatives who see you in your offices about once a year. Perhaps there is something about Phospho-Soda (Fleet), the pure, stable, aqueous concentrate of the two U.S.P. Sodium Phosphates, you would like to discuss with them.

GENERAL ELECTRIC X-RAY CORPORATION
Los Angeles **Renaissance Room**

A display of X-Ray and Electro-Medical Equipment and Supplies.

GERBER PRODUCTS COMPANY
Fremont, Michigan **Renaissance Room**

You are cordially invited to visit Gerber's exhibit of Strained Foods, Junior Foods, Pre-cooked Cereals and the new Gerber-Armour Meats for Babies.

We invite your inspection of our service materials on infant feeding and adult special diets, especially the newly revised and enlarged Special Diet Recipes Booklet.

GOLDEN STATE COMPANY, Ltd. **Galeria Room**
Los Angeles

Golden State Dairy Products will feature an exhibit displaying their products of special interest to the medical profession. These will include Golden V Vitamin milk, Vitamin D milk, Buttermilk, Skim Milk, Cream O' Gold Premium Milk, Yami Yogurt, Vitamin D Increased Evaporated Milk and Powdered Whole Milk, sampling doctors with these products and distributing literature to further demonstrate the great nutritional values of dairy products in the diet. The theme of the exhibit will be "You Strike It Rich in Golden State Dairy Products" which is not only the company slogan but ties in with the current three-year Centennial Celebration.

GUILDCRAFTERS OF HOLLYWOOD
Hollywood **Galeria Room**

Art metalwork in the form of plaques. The designs are insculptured, the lettering engraved. Quotations, Oath of Hippocrates, etc. Awards for outstanding service. Medical Fraternities and Honor Societies certificates in metal. Push buttons in chrome, bronze and brass for home and office. Special desk, wall and outdoor signs. Maker of the plaques for the Past Presidents of the California Medical Association.

HARROWER LABORATORY, Inc.
Glendale **Renaissance Room**

The Harrower Laboratory technical exhibit presents gastroscopic and acidity control studies relative to Mucotin, the coating antacid. The exhibit has three main points of interest: (1) A case history report of a large benign crater ulcer. The ulcer and its response to treatment are illustrated gastroscopically. (2) The effect of aluminum hydroxide, magnesium trisilicate, Sippy type formula and Mucotin on the degree of acidity, duration of antacid actions, and acid rebound is presented graphically. (3) Gastroscopic studies showing the coating action of Mucotin on a large gastric ulcer. Mucotin is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

HOFFMAN-LA ROCHE, Inc. **Renaissance Room**
Nutley, New Jersey

Roche will feature Thephorin Ointment, a superior antipruritic. Thephorin Ointment, which contains 5 per cent Thephorin (a superior antihistamine) in a Carbowax base, is especially valuable in the treatment of allergic dermatoses, pruritus and insect bites. Thephorin, also available in liquid and tablet forms, is the Roche brand of phenindamine. It is very helpful in the control of allergic complaints. Presidon 'Roche,' the new sedative-hypnotic which is not a barbiturate but a pyridine derivative, will also be displayed. Presidon, supplied in scored 0.2-Gm. tablets, is mild and well tolerated by young and old patients alike.

HOLLAND-RANTOS COMPANY, Inc.
New York, New York **Renaissance Room**

Koromex Jelly and Koromex Cream are well-known to physicians generally for their uniformly high standard of quality and time-tested dependability. You will want to see the latest improvements in package design, the economical large refill tube now available, as well as the attractive, ivory-colored plastic box (Koromex Refillable

Unit) which provides a sanitary, convenient, permanent container that will appeal to your patients. Medical service representatives will be pleased to discuss other H-R products of particular interest to you.

LAKESIDE LABORATORIES, Inc. Ballroom Foyer
Milwaukee, Wisconsin

Three Lakeside specialties will be exhibited . . . Mercuhydrin—the mercurial diuretic in the modern management of cardiac decompensation in general practice. New schedules and techniques of medical treatment in this condition will be the point of interest at the exhibit. Cholatropin—a new antispasmodic, hydrocholeretic combination. Estrotate—the most potent acetate ester of the natural occurring true ovarian hormone alpha-estradiol. Representatives will be prepared to discuss these products and will have available reprints and other materials.

LANTEEN MEDICAL LABORATORIES, Inc.
Chicago, Illinois Galeria Room

Lanteen Medical Laboratories, Inc., extends a cordial invitation to visit Booth No. 69. Representatives will be pleased to discuss a new diaphragm fitting technique with you and explain the advantages of the Lanteen Flat Spring Diaphragm.

LEDERLE LABORATORIES Renaissance Room
New York, New York

You are cordially invited to visit our exhibit in Booth No. 47, where you will find representatives who are prepared to give you the latest information on Lederle products.

LIBBY, McNEILL & LIBBY Renaissance Room
Chicago, Illinois

Physicians are cordially invited to stop and discuss Libby's strained and homogenized baby foods, which are featured.

ELI LILLY AND COMPANY Ballroom Foyer
Indianapolis, Indiana

Your Lilly medical service representative cordially invites you to visit the Lilly exhibit located in Booth No. 14. Many new therapeutic developments will be featured and literature on these products will be available. Lilly medical service representatives are to be in attendance to aid visiting physicians in every way possible.

J. B. LIPPINCOTT COMPANY Ballroom Foyer
Philadelphia, Pennsylvania

J. B. Lippincott Company presents an interesting and active exhibit of professional publishing. With the "pulse of practice" centering in an advisory editorial board of active clinicians who constantly review the field, current and coming trends in medicine and surgery are known continually. On the studied recommendations of these medical leaders, Lippincott Selected Professional Books are undertaken.

LOV-É BRASSIERE COMPANY
Hollywood Renaissance Room

Lov-é Brassiere Company, manufacturers and retailers of the extensive Lov-é line of corrective and surgical brassieres. These custom-fitted brassieres are an aid in the treatment of specific breast conditions. From more than 500 bust-cup-torso size variations the patient's correct size is selected, then fitted to her individual measurements by specially trained Lov-é technicians, according to the physician's exact instructions.

M & R DIETETIC LABORATORIES, Inc.
Columbus, Ohio Ballroom Foyer

M & R Dietetic Laboratories, Inc., Booth Number 21, will display Similac, a food for infants. Our representatives will appreciate the opportunity to discuss the merit and suggested application for both the normal and special feeding cases.

THE S. E. MASSENGILL COMPANY
Bristol, Tennessee Galeria Room

Representatives of the S. E. Massengill Company are in attendance at the exhibit to discuss with you a number of Massengill products which are being featured during this meeting. The design of the booth calls your attention to the wide coverage offered the medical profession through the medical service representatives and branch offices of the company. You are invited to visit and talk with us on the featured preparations and register for sample packages and literature.

MEAD JOHNSON & COMPANY
Evansville, Indiana Renaissance Room

The newer knowledge of medical nutrition is translated into practical application with the products and diet services at the Mead Johnson Exhibit.

There are new Mead Products for the pediatrician. There will be special products for the obstetrician. Mead's pioneering of the protein field has perfected Amigen for parenteral and Protenum, for oral use.

Mead's California representatives will be present.

THE MEDICAL PROTECTIVE COMPANY
Fort Wayne, Indiana Ballroom Foyer

The Medical Protective Company is represented at Booth No. 22 where you are invited to call. Medical Protective Service is an institution of the medical profession whose legal liability problems we have concentrated upon for fifty years.

Bring your professional liability questions and problems to Booth No. 22.

Our representative is at your service to present our protection plan, to explain the peculiar relation of the doctor to the law which governs your practice or to discuss any particular phase of professional liability in which you are especially interested.

MERCK and COMPANY Galeria Room
Rahway, New Jersey

The products featured in this display include Cobione (Crystalline Vitamin B_{12} Merck), as well as Neo-Antergan and Dihydrostreptomycin. Neo-Antergan is the Merck antihistaminic drug which has proven to be the product of choice of many clinicians throughout the country. Dihydrostreptomycin Merck represents a great achievement in the evolution of antibiotic therapy. Cobione will prove of interest to all.

THE WILLIAM S. MERRELL COMPANY
Cincinnati, Ohio Ballroom Foyer

Prompt relief in 85 per cent to 90 per cent of bronchial asthma and associated conditions, with inconspicuous side effects, is the report from an 8-year clinical study of Nethaphyl in 1,400 cases, a new Merrell Product. Nethaphyl is safe over long periods of use, prolonged in action, and effective in most ephedrine-fast cases.

E. S. MILLER LABORATORIES, Inc.
Los Angeles Renaissance Room

The E. S. Miller Laboratories, manufacturers of ethical Pharmaceutical Products since 1923, will exhibit a complete line of injectables, tablets and capsules. Especially featured will be their line of Hormones.

C. V. MOSBY COMPANY Renaissance Room

St. Louis, Missouri

The newest and latest books in medicine, surgery and the specialties will be on exhibit for your inspection at Booth No. 46.

NESTLÉ COMPANY INC. Renaissance Room

New York, New York

We are going to serve our soluble coffee product, Nescafé, to everyone and are planning to display our Nestlé Evaporated Milk and baby food products. These consist of Lactogen, Dextrogen, Pelargon and Nestlé Food.

THE NETTLESHIP COMPANY

Los Angeles Renaissance Room

The Nettleship Company of Los Angeles, Malpractice Insurance Specialists, Administrators of official malpractice (also Group Accident and Health) insurance programs for L.A.C.M.A.—Santa Barbara, Kern, Tulare and Orange County Societies. Serving the healing profession since 1925. Specimen consent and authority forms available for convention attendants.

ORTHO PHARMACEUTICAL CORPORATION

Raritan, New Jersey Galeria Room

Ortho cordially invites you to Booth No. 65 where the full line of Ortho specialties will be exhibited. Featured will be Ortho Gynol, Ortho Creme, and other Ortho products used in the control of conception. Newer gynecological pharmaceuticals will also be on display..

PARKE, DAVIS & COMPANY Renaissance Room

Detroit, Michigan

Members of the Parke, Davis & Company Medical Service Staff will be on hand at our Commercial Exhibit for consultation and general discussion of the products classified in our Pharmaceutic, Antibiotic, and Biologic Lines. Important Specialties, such as Penicillin S-R, Benadryl, Vitamin Products, Hypnotics, Antibiotics, Etamon, Oxycel, Thrombin Topical, Influenza Virus Vaccine, and other Biologics will be featured. You are cordially invited to visit our booth with the assurance that your interest will indeed be very much appreciated.

THE PELTON & CRANE COMPANY

Detroit, Michigan Renaissance Room

The Pelton line affords the widest selection of private office sterilizers offered by any manufacturer: Portable Sterilizers, 8 to 20 inches, automatic or manual control, bright or satin chrome finish. Cabinet Models featuring enamel or laminated tops, with or without timer, double or single door . . . all with interior illumination. Autoclaves with selective temperature control at no extra cost. Water Sterilizers in 2- and 5-gallon sizes. Price conscious or luxury minded, your logical choice is Pelton.

PET MILK COMPANY Ballroom Foyer

San Francisco

You are invited to visit Booth No. 6 where you will see an attractive display of Pet Milk. Valuable information on the use of this milk for infant feeding, child feeding and general diet will be presented. An accurate description of the fortification of Pet Milk with vitamin D will be available to physicians who are interested. The Pet Milk Formula Selector and Solid Food Guide and the Pet Milk weaning cup will be available to doctors wishing them. A miniature can of Pet Milk will be given to all registrants.

PHILIP MORRIS & CO., Ltd., Inc.

New York, New York Renaissance Room

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject and problems on the physiological effects of smoking.

PICKER X-RAY CORPORATION Galeria Room

The Picker X-Ray, Southern California, Inc. in cooperation with the Sicular X-Ray Company, Inc., of San Francisco, are displaying the Picker X-Ray Corporation line of x-ray equipment and supplies. Exhibited are the V-7-200MA Transformer and Control with Motor Driven Tilt Table and Motor Driven Spot Film Device.

PLASTISHIELD, INC. Ballroom Foyer

Minneapolis, Minnesota

To encourage breast feeding of newborn infants, the new Plastishield technique of breast care is rapidly gaining in popularity. This simple, more sterile method of nipple care protects against irritation and eliminates the necessity for messy medication. Plastishields are correctly shaped plastic shields, easily cleaned and conveniently worn beneath the customary hospital support or brassiere. They keep the nipples moist and pliable, thus preventing painful fissuring and soreness.

Trained nurses will be available at our exhibit to explain this new technique.

RADIUM CHEMICAL COMPANY, Inc.

New York, New York Galeria Room

The Radium Chemical Company, Inc. of New York whose West Coast Sales Office and Radon Apparatus was recently opened in Los Angeles, will exhibit a complete line of the latest in radium and radon accessories. Their California representative, Mr. Charles F. Bergesch, will be in attendance to give information about their radon and radium service.

A. H. ROBINS CO., Inc. Renaissance Room

Richmond, Virginia

A. H. Robins Co. will conduct a display using draperies and flowers as a background in which the following preparations are to be featured: *Donnatal*—Antispasmodic and Sedative. *Pabalate*—Anti-arthritic and Antirheumatic compound. *Phenaphen*—Analgesic, Sedative, and Antipyretic. *Allbee*—High potency B-complex. *Allbee with C*—Therapeutic dosages B-complex and C vitamins. *Sedobarb*—Effective Sedative and Hypnotic. Literature and samples will be readily available.

J. B. ROERIG AND COMPANY

Chicago, Illinois Renaissance Room

Members of the California Medical Association are cordially invited to visit the exhibit of J. B. Roerig and Company. Mr. E. H. Roerig will be in charge of the exhibit and will be pleased to offer the services of the Professional Service Department to all interested guests.

SANBORN COMPANY Galeria Room

Cambridge, Massachusetts

An exhibit of interest to clinicians, specialists, and research men alike—in the fields of cardiology and endocrinology—will be found at the Sanborn Company Booth No. 72.

On display will be working models of such clinical diagnostic instruments as the Sanborn Metabulator, the "all enclosed" metabolism tester; and the Sanborn Viso-Cardiette, leader among direct writing electrocardiographs.

These will be supplemented by more specialized, research-type equipment, including the Poly-Viso Cardiette, multi-channel biophysical research recorder; the Electromanometer, outstandingly useful for a wide variety of venous, arterial, intracardiac, and other pressure recordings; and other diagnostic instruments of still more recent development.

SANDOZ PHARMACEUTICALS **Ballroom Foyer**
San Francisco

This display will feature Mesantoin and Hydantal, new anticonvulsants for the treatment of epilepsy, D.H.E. 45 (Dihydroergotamine) for the parenteral treatment of migraine; Caffergone, for the oral treatment of migraine and other types of headache; Methergine, a new oxytocic and several cardiac glycosides including Cedilanid, Digilanid and Strophosid.

Well-informed attendants will be present to answer all inquiries and to discuss new products to be released in the near future.

W. B. SAUNDERS COMPANY **Ballroom Foyer**
Philadelphia, Pennsylvania

We invite all doctors attending the meeting of the California Medical Association to visit our exhibit where our representative, Mr. J. Keith Chrysler, will display a complete line of our books including Hyman's *Integrated Practice of Medicine*, Bockus' *Gastro-enterology*, Meleney's *Treatment of Surgical Infections*, Snyder's *Obstetric Analgesia and the Child*, Lyons and Woodhall's *Atlas of Peripheral Nerve Pathology*, Crile's *Practical Aspect of Thyroid Disease*, *Diet Manual of the Mayo Clinic*, De Gowin, Hardin and Alsever's *Blood Transfusion*, Levin and Harvey's *Clinical Auscultation of the Heart*, Fine's *Care of the Surgical Patient*, Conn's *Recent Advances in Therapy*, Dowling's *Acute Bacterial Diseases*, Brams' *Treatment of Heart Disease*, new editions of McLester's *Nutrition and Diet in Health and Disease*, Weiss and English's *Psychosomatic Medicine*, and many others.

SCHENLEY LABORATORIES, Inc. **Galeria Room**
New York, New York

The Schenley Laboratories' exhibit features Titralac, an extremely palatable antacid with a titration curve very similar to that of milk. Also on display will be Rutaminal, an exclusive Schenley specialty combining rutin, aminophylline, and phenobarbital; Orapens — buffered penicillin tablets of varying strengths; Monocillin, a procaine penicillin product producing 96-hour blood levels; and Aquacillin, procaine penicillin for aqueous injection.

Well informed personnel will be in attendance. Samples of various products will be available.

SCHERING CORPORATION **Renaissance Room**
Bloomfield, New Jersey

Buccal Tablets of *Oreton*, *Progynon*, *Proluton*, and *Cortate* with the new base Polyhydrol, will be featured at the Schering exhibit. Developed in the Schering research laboratories, the new Polyhydrol base provides a means of completely utilizing hormones without the necessity of injection. *Trimeton*, an outstanding antihistamine, and *Thalamyd*, Schering's brand of phthalylsulfacetamide, a new sulfonamide extremely effective in ulcerative colitis and enteric infections, will highlight the exhibit.

Schering representatives will be present to welcome you and will be happy to answer inquiries concerning Schering's new products as well as their other hormone, x-ray diagnostic, chemotherapeutic, and pharmaceutical specialties.

G. D. SEARLE & CO. **Renaissance Room**
Chicago, Illinois

You are cordially invited to visit the Searle booth where our representatives will be happy to answer any questions regarding Searle Products of Research.

Featured will be Ruphyllin, for abnormal capillary fragility, Hydryllin, new and effective antihistaminic, as well as such time-proven products as Searle Aminophyllin in all dosage forms, Metamucil, Ketochol, Floraquin, Kiophyllin, Diodoquin, Pavatrine and Pavatrine with Phenobarbital.

SHARP & DOHME INCORPORATED
Philadelphia, Pennsylvania **Galeria Room**

Visitors attending the California Medical Association meeting are cordially invited to visit the Sharp & Dohme exhibit in Booth No. 64. Stable, portable 'Lyovac' Normal Human Plasma irradiated to destroy not only bacteria but also the viral contaminants that might cause homologous serum hepatitis merits your attention. Unusual specialties including the popular sulfonamide and antibiotic drugs also will be of major interest. Courteous attendants will be pleased to serve you.

SMITH-DORSEY PHARMACEUTICALS
Lincoln, Nebraska **Ballroom Foyer**

Aminophylline Suppositories and Estrogenic Hormones will be shown at the Smith-Dorsey exhibit as well as a wide variety of injectable preparations. Physicians are invited to make the Dorsey booth their headquarters during the show and representatives will be happy to discuss the background and use of all products on display.

SMITH, KLINE & FRENCH LABORATORIES
Philadelphia, Pennsylvania **Renaissance Room**

'Dexedrine' Sulfate and *'Benzedrine' Sulfate*—'Benzedrine' Sulfate (racemic amphetamine sulfate, S.K.F.) has, through the years, grown steadily in clinical usefulness. Today, it is one of the fundamental drugs in daily medical practice.

'Dexedrine' Sulfate (dextro-amphetamine sulfate S.K.F.) was developed in the search for an even more outstanding anti-depressant. Largely because of the striking preponderance of its central nervous effect over its weak peripheral activity, it has become the drug of choice in most cases. In weight reduction, it is generally recognized as the most effective drug available for control of appetite.

E. R. SQUIBB & SONS **Ballroom Foyer**
New York, New York

E. R. Squibb & Sons will feature Dihydrostreptomycin and the new Penicillin Dispolator.

J. W. STACEY, Inc. **Ballroom Foyer**
San Francisco

At Stacey's Booth No. 12 you will find a display of all of the new medical books for both general practitioners and specialists. You are cordially invited to browse at your leisure.

STAYNER CORPORATION **Renaissance Room**
Berkeley

Stayner Corporation again expresses its sincere appreciation to the Western Medical Profession for its splendid support. Your cooperation and confidence have made it possible for us to offer over 120 pharmaceutical products of highest quality. Featured at the Stayner Booth will be our product "STS" Lozenges for the local treatment of oropharyngeal infections. We are featuring, as well, our fortified high potency B Complex with Liver and Iron preparation, "Hema-Forte."

THE STUART COMPANY **Galeria Room**
Pasadena

The *Stuart Formula*, liquid and tablets, multiple vitamin and iron therapy at maintenance level. The *Stuart Therapeutic Multivitamin*, multiple vitamin therapy at the therapeutic level. The *Stuart Therapeutic B Complex, C,* water-soluble vitamin therapy at the therapeutic level. The *Stuart Hematinic*, iron, copper, B complex and C, therapy at therapeutic level. The *Stuart Hematinic* with Folic Acid. The *Stuart Hematinic* Liquid. These six Stuart products can help simplify nutritional prescriptions. Easy to remember—the name Stuart and the therapy needed. We hope you will visit the Stuart exhibit.

U. S. VITAMIN CORPORATION **Ballroom Foyer**

New York, New York

Enlarged color photographs of common oral lesions of nutritional deficiencies including glossitis, cheilosis, gingivitis and others . . . as well as improvement following administration of complete vitamin therapy. Also, professional samples and literature on Vi-Syneral, Vi-Syneral Vitamin Drops, Vi-Syneral Injectable, Methischol, Tri-Sulfanyl, Lipo-Heplex, Hypervitam and others.

THE UPJOHN COMPANY **Galeria Room**

Kalamazoo, Michigan

The Upjohn Company presents a new sympathomimetic agent Orthoxine for the prevention and treatment of Bronchial Asthma. Orthoxine is an orally effective chemical entity singularly specific as a bronchodilator and unusually free from side effects.

WALKER VITAMIN PRODUCTS, Inc.

Mount Vernon, New York **Galeria Room**

Protoplex will be featured at the Walker exhibit. This new product combines the proteins from casein, lactalbumin, yeast and liver in delicious cereal-like granules.

Precalcin, the "dry-fill" capsules of vitamins and minerals for prenatal use, will also be shown along with the Hyvanol-Amvitol products for nerve deafness.

Other important therapeutic agents will also be on display.

WALTERS SURGICAL COMPANY

Los Angeles **Renaissance Room**

Office equipment, short wave diathermy, E.K.G. apparatus, and instruments will be on display in Booth No. 26.

WESTINGHOUSE ELECTRIC CORPORATION

Los Angeles **Galeria Room**

We intend to exhibit bank of illuminators and x-ray control equipment.

WESTWOOD PHARMACAL CORPORATION

Buffalo, New York **Ballroom Foyer**

Westwood Pharmacal will display *Lowila*—a soap substitute (detergent), *Westhiazole Vaginal*—for trichomonas, and *Gentia-Jel*—for fungus infections of the vagina.

WHITE LABORATORIES, Inc. **Ballroom Foyer**

Newark, New Jersey

White's Dienestrol Tablets and Dienestrol Suspension (Council Accepted)—a new orally effective synthetic estrogen is featured. Complete information and literature are available regarding the advantages of Dienestrol's high biologic activity, excellent patient-tolerance and economy.

Other products of White Laboratories, Inc. are on display and White's Medical Service Representatives in attendance will be pleased to supply any further information requested.

WINTHROP-STEARNS, Inc. **Renaissance Room**

New York, New York

Winthrop-Stearns, Inc., New York, extends a cordial invitation to visit its Booth No. 43, where representatives will be on hand to discuss the latest pharmaceutical contributions made by this firm. Featured will be Isuprel, new, more efficient and convenient bronchodilator; Demerol, powerful analgesic, spasmolytic and sedative; especially well suited for pre- and postoperative use.

* * *

PRE-CONVENTION REPORTS

Officers • Councilors • Committees • County Societies

REPORTS OF GENERAL OFFICERS

REPORT OF THE PRESIDENT

To the Members of the California Medical Association and the House of Delegates:

This has been a memorable year for the California Medical Association. California medicine has been confronted for a long time with problems that to the rest of the United States seemed only a peculiarity of ours. They were blights or misfortunes that others were sincerely sorry for, in a jocular way, but they seemed not worry over them as a possible menace to themselves.

This year has shown that no area of our United States or even the world is immune to politically astute planners who deliberately destroy the things that they promise to their deluded listeners. After they have destroyed the things people most treasure, little benefit remains for the penitent public who have been bilked of their birthright. As an Englishman wrote me regarding English socialism and especially their National Health Service, "I think it would be true to say that most of us are completely disillusioned and that we are unpleasantly aware that we have let the side down and at the same time sacrificed our essential freedoms for a security which is itself largely illusory. I hope sincerely that, if you people ever come to suffer from a wave of Utopian planners, you will realize the dangers in time, and that you will unite in absolute refusal to allow anyone to tamper with the freedoms of medicine."

To the medical profession has been given the leadership in fighting to preserve a high quality of medical care for the people. It so happens that by winning this battle we may by our example be able to awaken the people to the dangers that confront them which if not realized in time may destroy all other aspects of freedom that we hold most dear.

I have attempted to perform my duties during this past year in my office as your President. I bespeak for my successor your continued support.

May we continue our efforts and bring by a united profession the leadership that our country so sorely needs today.

Respectfully submitted,
E. Vincent Askey, *President*

REPORT OF THE PRESIDENT-ELECT

To the President and the House of Delegates:

As President-Elect I have attended all the meetings of the Council and Executive Committee. I represented the C.M.A. at the Rural Health Conference in Sacramento. I visited the medical officers of the Oregon State Medical Society and had conferences with them. I also called upon the President-Elect of the Montana State Medical Association in Great Falls. I have visited several of the northern county medical societies during the year. I was guest speaker at the state meeting of the Grange. I attended the Stockton postgraduate tenth anual session as a guest. I have served on several committees endeavoring to carry out the policies laid down by the C.M.A. Council.

Respectfully submitted,
R. Stanley Kneeshaw, *President-Elect*

REPORT OF THE SPEAKER OF THE HOUSE OF DELEGATES

To the President and the House of Delegates:

"I heartily accept the motto—'That government is best which governs least'; and I should like to see it acted up to more rapidly and systematically. Carried out, it finally amounts to this, which also I believe—'That government is best which governs not at all'; and when men are prepared for it, that will be the kind of government which they will have."—Henry David Thoreau, 1817-1862.

A report covering any phase of the Association's activities for the year just past must necessarily record the fact that a large part of those activities has been occasioned by the constantly increasing threat of governmental domination. Just as in previous recent years, but to a greater extent than ever before, there have come the almost innumerable proposals that state or federal bodies, quasi-public agencies, or organized do-gooders take over large segments of the practice of medicine on the general theory that the American people are falling apart at the seams, and that of course the only remedy is to pass another law and to establish another bureau.

Is it not about time that we have done once and for all with defensive rear-guard action? Is it not indeed long past high time when we should call upon the forces of government to give an accounting of their stewardship over the fiscal and social affairs of the citizen during these past decades?

Historically, the record of government in the manipulation of the citizen's affairs is a sordid one, indeed. This can be duly documented and substantiated by references beginning with Hammurabi, the Babylonian, in 2285 B.C., and carried on down through Diocletian, the Roman, in 301 A.D., the Chinese New Dealers under Wong-An-Shih in 1068 A.D., the experiences of Robespierre and Marat in the French Revolution in 1789, down to date, to mention just a few of the outstanding examples. Governmental planning and control have always brought a precipitate drop in production, widespread black markets, and rampant corruption. Is is not reasonable that government be required to submit its accounts to an honest open audit rather than to disguise those accounts with fictitious bookkeeping subterfuge and all manner of hidden taxes designed to confuse and obfuscate?

American Medicine, like the American system of private enterprise, of which it is an integral part, is proud to stand upon its record of accomplishment for the people it serves. Just as our system of private enterprise has given us the highest standard of living known today in terms of the essentials and comforts of life and made that standard available to a greater degree than achieved elsewhere in the world, so has American Medicine made the American people the healthiest people in the world today when comparable populations are considered.

Never before in the world's history have there been available so many different and effective media for the dissemination of facts. Your Association believes that if the people of California and of the country as a whole really know the facts about medical care, there will be no doubt about their choice of the manner in which that care is to be administered. Obviously, the attack on Medicine represents just one front of the attack upon every phase of our economy, and leaders in every walk of life are beginning to realize this fact. Medicine has a wonderful opportunity to lead the way in a return to the economy of sanity and abundance.

The chips are down. The stakes are not just marbles.

Respectfully submitted,
L. A. Alesen, *Speaker*

REPORT OF THE VICE-SPEAKER

To the President and the House of Delegates:

The Vice-Speaker has attended all the meetings of the State Council and has carried out the special assignments, as designated by the Council and its officers.

The setting up of a pension plan for key employees of the Association has now been accomplished and is in operation. This has been carried out through a life insurance plan whereby the Association will be protected against the loss of a valuable employee. Funds from this insurance plan are available for the payment of pensions when the key employees arrive at the age of retirement.

Respectfully submitted,
Donald A. Charnock, *Vice-Speaker*

REPORT OF THE CHAIRMAN OF THE COUNCIL

To the President and the House of Delegates:

By the time the House of Delegates meets in May 1949, the Council will have finished another year.

The new members of the Council, elected in 1948, have been present at all meetings of the Council to date.

The work of the Council has this year been heavier than usual in that many items of business which necessitated a great deal of work have come up during the year. The advice of the Council was needed on the work being done by the advisory committee to the State Department of Public Health on the chronic disease situation, and a good many hours of the Council's time were devoted to this purpose. Discussion of many other important reports from other committees or commissions of the Council have necessitated large amounts of time. Such reports would include the report of the Cancer Commission; the report of the Committee on Alcoholism; the Blood Bank Commission, and many others, all of which have done a splendid piece of work during the year.

As Chairman of the Council I am very happy to report that there seems to be a spirit of unity and cohesion throughout the state that has not been equalled before.

At the time of the writing of this report, the campaign of the American Medical Association against compulsory health insurance on a federal basis is just starting, and it is hoped that, with the impetus that will be given to it by the California members who are on these committees, the campaign will be successful.

It is the desire of the Chairman of the Council at this time to thank all members of the Council for the amount of time, effort and thought that has been put into the work that the Council has done, and it is likewise the Chairman's desire to thank again those in the office of the California Medical Association for their complete cooperation and effort.

Respectfully submitted,
Edwin L. Bruck, *Chairman of the Council*

Report of the Council

To the President and the House of Delegates:

The Council has held six meetings since the close of the 1948 House of Delegates sessions. These were held on April 14 (for organization purposes), June 5-6, August 21-22, October 30-31 and December 18-19, 1948, and March 5-6, 1949. Additional meetings will be held prior to the start of the 1949 Annual Session and, under constitutional provisions, each day during the Annual Session.

Minutes of the Council meetings have been printed in California Medicine following each meeting.

It is to be noted that all Council meetings during the year are now held on week-ends and for a period of two days. The volume of work appearing on the agenda for each meeting is so heavy that shorter sessions are not feasible. In addition, the Council reviews the actions of the Executive Committee, which holds meetings between the sessions of the Council and serves to make determinations of policy on short notice, where Council meetings would not be practicable.

As a part of this report the Council digests some of the major items which have been dealt with during the past year. Any additional items which may appear prior to the Annual Session will be reviewed in a supplemental report to the House of Delegates.

1. *Organization:*

The Council is pleased to report that a Southern California office has been opened, located in the Subway Terminal Building, Los Angeles, and that Mr. Ed Clancy has been appointed Field Secretary in charge of this office. The Los Angeles office has operated well within the budget assigned to it and Mr. Clancy has at all times been available to visit county societies to assist in their problems and to counsel with their officers on matters of public relations, public policy and related items. The operation of the Los Angeles office has been a decided benefit to members of the Association in the southern counties and has served to provide a more direct and more rapid service to members and county societies in that area.

2. *Membership of Association:*

Membership in the Association reached a new record high at the close of 1948, with 9,240 active members listed. At the year-end there were 455 members shown on the records as delinquent, an unusually high number which the Council wishes to point out as representing an accumulation of lapsed memberships following the termination of the war. During the war years many members who served in the armed forces determined to establish themselves in other areas upon their return to civilian life and the large number of delinquent members at the end of the year reflects the accumulation of five years in this respect. Currently the membership of the Association is at a new record high and has reached the point where the Association is now entitled to ten, rather than nine, Delegates to the American Medical Association.

3. *Committee on Constitution and By-Laws:*

In accordance with a vote of the 1948 House of Delegates, the Council appointed a committee of five members to review the Constitution and By-Laws. This committee has met during the year and, it is understood, will bring in its report to the 1949 House of Delegates. Thereafter the members of the House of Delegates will have the opportunity to vote on any recommendations made.

4. *Committee on Crippled Children's Act:*

The Council also appointed a committee to investigate the authority and operations of the Crippled Children's Bureau, in accordance with a decision of the 1948 House of Delegates. This committee has also met and will bring in its report to the next meeting of the House of Delegates.

5. *Industrial Fees:*

The Council has reviewed the recommendations of the Committee on Industrial Practice and has approved a proposed schedule of fees for compensation cases prepared by that committee. On September 1, 1948, the Association petitioned the Industrial Accident Commission of the State of California to adopt this proposed schedule of fees. Thereafter, on November 8-10, 1948, the Industrial Accident Commission adopted a resolution which (1) tabled the Association's request for adoption of a revised fee schedule, (2) stated the Commission's belief that it had no direct statutory authority to promulgate and enforce a schedule of medical and surgical fees, (3) suggested that the medical profession or the insurance interests introduce legislation to give the Commission this authority, and (4) stated that the existing fee schedule would be recognized only until June 30, 1949. Thereafter the Council voted to recommend to all members of the Association that the proposed fee schedule be made effective for all services performed on or after February 1, 1949.

Following this notification to members, the insurance interests writing the bulk of compensation insurance in California voted to recognize only the previous schedule of fees and suggested that a committee of insurance men and a similar committee from the Association meet to attempt to work out a fee schedule which could be recognized as a minimum by both parties. Such a committee has been appointed by the Council and it is hoped that a speedy solution to this problem may be worked out. Meanwhile, the great bulk of the membership has expressed itself as favoring the proposed fees.

6. *State Department of Public Health:*

The Council has been pleased to have the State Director of Public Health as a guest at its meetings during the past year. Among other items which have been discussed in the field of public health are the approval of a proposed mass chest survey for tuberculosis by the U. S. Public Health Service in four metropolitan areas and approval of a study of chronic diseases made by the Department of Public Health with the cooperation of advisory committees on which the Association was represented.

7. *American Public Health Association:*

The Council appointed a representative to attend the annual meeting of the American Public Health Association, at which it was voted to create a Section on Medical Care. Attention is called to the existence of this section, particularly since it may be employed as a means of advancing theories leading toward the establishment of tax-supported systems of medical care.

8. *Veterans' Administration:*

The Council adopted two resolutions bearing on the Veterans' Administration, one of them decrying the establishment of regional or subregional diagnostic and/or treatment centers in areas where the services of physicians are already available and the other calling attention to the fact that the admission of non-service connected disability cases to Veterans' Hospitals and, through contract, to Army and Navy hospitals was causing an undue demand to be made on the medical staffs of the Veterans' Administration and the armed forces. Copies of these resolutions were forwarded to Government officials and it is interesting to note that some of the items complained of in these actions have been given further notice in the preliminary reports of the Hoover Commission on Governmental Reorganization in the Executive Departments.

9. *Public Policy and Legislation:*

The Council wishes to call attention to the fact that the present session of the State Legislature is faced with almost 5,000 measures, the largest number ever introduced in any state legislative body. Many of these bills would tend to permit practices by members of some healing arts groups which do not qualify by training and experience to provide such services to the public. The Council expresses grave concern over the attempts of certain groups to obtain a foothold through legislative action in fields for which their members are not trained or qualified and where public harm may result.

Compulsory health insurance is again before the Legislature in bills introduced on behalf of Governor Warren and the State Federation of Labor, A. F. of L. The Association will continue to oppose these measures.

The thanks of the Council and of the Association are hereby extended to Dr. Dwight H. Murray, Chairman of the Committee on Public Policy and Legislation, for his untiring efforts to look after the best interests of the public and the medical profession in directing the Association's activities in this field. Mr. Ben Read, Executive Secretary of the Public Health League of California, and Mr. Ed Clancy, C.M.A. Field Secretary, have also given valuable help in this endeavor.

10. *Public Relations:*

The Council has given continuing approval to the work of the Committee on Medical Economics in working toward establishment of a program of individual public relations for members in their dealings with their patients. Approval has been given to a pamphlet aimed at this objective and planned for distribution to all members; further studies are under way by this committee and will be given full consideration when ready.

In addition, the Council has approved a continuation of the radio program, *California Caravan,* which has been operating for several years. This now constitutes the only direct public relations activity of the Association in the field of an appeal to the public. The American Medical Association has recently adopted a program of public relations which will probably replace, to a large extent, the individual programs of the various state associations and in which the California Medical Association will have its own part to play. Two Californians have been appointed to the nationwide committee to supervise this program and one, Dr. John W. Cline, has been named as one of three members of the A.M.A. House of Delegates to sit with members of the A.M.A. Board of Trustees and officers as a Coordinating Committee to make policy for this program. The A.M.A. plan is being financed by an assessment of $25 against each of its members and it is gratifying to report that the physicians of California have been prompt in meeting this request, the first appeal for funds made by the A.M.A. in its 102 years of existence.

As an added item, the Council has approved the distribution to all high school, junior college and college libraries in California of copies of the Brookings Institution report on "The Issue of Compulsory Health Insurance." This volume constitutes one of the few available works representing an objective study of this matter and not produced as a propaganda piece; the libraries of the schools have been grateful to receive this study for their permanent records.

11. *California Physicians' Service:*

The Council has maintained its practice of inviting representatives of C.P.S. to attend Council meetings and to participate in discussion of appropriate items. A more thorough understanding of C.P.S. has resulted from this practice and such participation is continuing. Among the principal items approved by the Council during the past year was the request that the Board of Trustees of C.P.S. provide for a thorough review of the entire schedule of fees by the special fee schedule committee created by action of the House of Delegates in 1946. It is understood that such a review has been undertaken by this committee and that a report will be made to the Administrative Members of C.P.S. at their meeting during the Association's Annual Session.

12. *Model Radiology Contract for Hospitals:*

During the past year the State Attorney General ruled that hospitals might not employ physicians to provide medical services on a basis which would return a profit to the hospitals. In order to continue the services of radiologists, pathologists and anesthesiologists where such physicians were practising in hospitals, the Council authorized the drafting of a model contract which would preserve the identity of the physician and continue his services to patients in the hospitals. While drawn primarily for radiologists, this proposed model contract is amenable to changes to make it applicable to physicians in any field of practice. This contract has been approved by the Council and is now in process of being put into effect in several hospitals.

13. *California Ambulance Association:*

The Council has been pleased to appoint Dr. Eugene F. Hoffman as its representative to sit with the board of the newly formed California Ambulance Association, an organization devoted to improving standards among ambulance operators. This organization has expressed its desire to establish standards which will meet with the approval of physicians for the care of their patients.

14. *Cancer Commission:*

The Council wishes to express its thanks and commendation to the members of the Cancer Commission for their continuing efforts in behalf of high professional standards in the detection and treatment of cancer. The Cancer Commission has maintained a splendid liaison with the American Cancer Society, has produced a film for professional education in cancer detection and has progressed in its work of establishing and supervising consultative tumor boards and cancer clinics. These activities have been of great benefit to the public and the profession alike.

15. *California Medicine:*

The Council wishes again to pay tribute to the Editor, Dr. Dwight L. Wilbur, for his splendid contribution in improving the standards of the official journal, CALIFORNIA MEDICINE. The journal has received nationwide acclaim for its excellence and the editor and his assistant are due a full measure of credit for this improved stature.

Thanks and commendation are also due to the Committee on Advertising, which screens all proposed advertising of products or services not already holding national recognition. The able efforts of this committee have borne fruit in the recognition of the journal as a preferred advertising medium open to those products or services which meet minimum standards of a high order. The profession in California is aided immeasurably by these activities.

16. *Conclusion:*

The Council wishes to pay tribute and express thanks to all committee members who have served during the past year. Some committees find few if any calls for their services but all are prepared on request to take appropriate action and to devote the time and effort necessary to reach the proper solution to problems facing the Association. Especially are thanks due to the Secretary, Dr. L. Henry Garland, who has served without compensation for the past two years and whose contributions to the Association cannot be measured.

Respectfully submitted,
EDWIN L. BRUCK, *Chairman of the Council*

REPORT OF THE PRESIDENT OF THE TRUSTEES OF THE C.M.A.

To the President and the House of Delegates:

The Trustees of the California Medical Association is a wholly-owned affiliate of the California Medical Association, the members of which are the members of the Council of the Association. The corporation holds meetings for the transaction of necessary business only and in the fiscal year ended June 30, 1948, such business was routine only. The financial report of the corporation is shown as a part of the report of the Treasurer of the Association, who also serves as Treasurer of the Trustees of the California Medical Association.

Respectfully submitted,
E. VINCENT ASKEY, *President*

REPORT OF THE SECRETARY

To the President and the House of Delegates:

Your Secretary has attended the meetings of the Council and the Executive Committee during the past year, in addition to many of the meetings of the Committee on Postgraduate Activities, the Legislative Committee, the Committee on Scientific Work and similar bodies appointed by the House. His main function has been with the Committee on Scientific Work, a report of which may be found elsewhere in this issue.

The minutes of the Council meetings, ably prepared by the Executive Secretary, should be read by all members.

At the termination of the 1948 Annual Session your Secretary regretfully felt compelled to tender his resignation, owing to the press of many duties (including those connected with practice, with presidency of the Radiological Society of North America, with a teaching position on the staff of a medical school, and so forth). He expressed the suggestion that the secretaryship of a large and important state organization such as ours requires the unrestricted attention of a physician, at least half-time. The Council graciously accepted the resignation, but requested him to serve as acting Secretary until a replacement was appointed. This it has been his privilege to do.

Sincere thanks are owed the officers of the Association and the staff of the Association's office for their cooperation and assistance during the year, especially Mr. Hunton, Mr. Wheeler and Mrs. Rooney.

Respectfully submitted,
L. Henry Garland, *Secretary*

REPORT OF LEGAL DEPARTMENT

To the President and the House of Delegates:

The Legal Department submits the following report covering the period from the last session of the House of Delegates to mid-February, 1949, the time of preparation of this report:

During the past year, we have attended all meetings of the Council, meetings of the Executive Committee, and various meetings of standing committees and other agencies of the Association. We have also prepared and rendered opinions on a variety of subjects, as requested by the Association or its officers or component societies.

In addition to our ordinary and regular services, we have also undertaken the following:

(a) As amici curiae we prepared and filed a brief before the California Supreme Court in the case of *Sinz versus Owens.* This case, which has not as yet been decided by the Supreme Court, involves two very important questions of law: First, whether a physician from one community may testify in a malpractice action against a physician in an entirely different community; second, whether a general practitioner is to be held to the degree of skill and care of a specialist if he undertakes to perform services in a field in which there is a specialist available in the community. With respect to the second issue, it has always been the law that a general practitioner is only held to the degree of skill and care of other general practitioners in the community, *unless he holds himself out as a specialist.* In the Owens case the physician concerned did not represent himself to be a specialist.

(b) We have conducted extended negotiations over a period of approximately nine months with the legal counsel for the Association of California Hospitals in an effort to arrive at a mutually satisfactory model contract form for use by hospitals and radiologists, and hospitals and pathologists. The fundamental objective to be attained is the settlement of the status of radiologists and pathologists in performing services in hospitals in a manner that is practical and that at the same time will not involve corporate practice of medicine on the part of the hospital or aiding and abetting unlawful practice on the part of the radiologist or pathologist. At the present time the model form of contract for hospitals and radiologists has been approved by the Council of the California Medical Association and is awaiting action by the Association of California Hospitals. The hospital-pathologist contract is almost complete, but there are still a few details that have not been satisfactorily solved. If a model *form* could be achieved it would, we believe, tend to remove one cause of friction between hospitals and physicians that has existed for many years. It would be a tremendous step forward in an effort to achieve solidarity and unanimity within the medical profession and its allied interests.

(c) We have assisted the Committee on Industrial Practice and the Executive Secretary in connection with the presentation to the Industrial Accident Commission of a revised fee schedule, and at meetings before that body.

(d) We have assisted the special committee appointed last year to review the proposed new Constitution and By-Laws, and have devoted considerable time to work with that committee.

There have been a number of other services performed by the Legal Department in connection with legislation and allied matters, which will be reported to the House of Delegates at its 1949 session.

We wish to reiterate our constant desire to serve the medical profession to the best of our ability.

Respectfully submitted,
Peart, Baraty & Hassard, *General Counsel*

REPORT OF THE EDITOR

To the President and the House of Delegates:

As part of a continuing effort to make California Medicine a more useful and readable journal for subscribers, several physical changes were made during the past year. To please the eye, the style of type used for the titles of articles was changed so that it now has kinship to the type face in which the text is cast. Subtitles in smaller type have been used to avoid the tedium of long headings in one large type face, and yet preserve a fully expressive title for indexing purposes.

Starting with the January 1949 issue, summaries have been printed at the beginning rather than at the end of articles, a departure that has been gratifyingly approved by all who have expressed an opinion to the editorial office.

Because so many of the manuscripts submitted are properly case reports, a separate section was established for their publication, in the interest of departmentalization for the greater convenience of readers.

That the journal might be more generally reflective of the practice of medicine in California, particular effort has been made to publish worthwhile articles written by physicians outside the metropolitan areas and the centers of medical teaching.

Although the number of articles printed in 1948 was considerably larger than the total for the preceding year—180 as compared with 110—a major editorial task again was that of selection. Because the number of manuscripts not originating from the Annual Session of the California Medical Association continued to increase, the total available for consideration was greater in the past year than in the preceding period. In the winnowing process a large part of the burden fell upon the members of the Editorial Board, whose great assistance in a necessarily cumbersome system of reviewing manuscripts by correspondence is gratefully acknowledged. Their tasks, and those of the editor too, were made the greater by the death last January of Dr. Lambert B. Coblentz, whose personality and judgment were a cogent influence in the executive committee of the Editorial Board.

The editor's thanks go also to Drs. Edgar Wayburn and Clarence J. Berne for handling the considerable difficulties of getting and editing material for the Clinical Symposium section, to those physicians who have written book reviews and other material upon assignment, to the office staff of the journal, and to the many others who have toiled for the purposes of California Medicine. Particular reference should be made to the continued excellent services rendered by Robert F. Edwards, assistant to the editor, in handling much of the detail of producing the journal.

Respectfully submitted,
Dwight L. Wilbur,
Editor, California Medicine.

REPORT OF THE EXECUTIVE SECRETARY

To the President and the House of Delegates:

The report of the Executive Secretary is presented, as in the past, in a series of sections devoted to his several duties. It is hoped that this form will be convenient for the House of Delegates and its reference committee which will consider this report.

1. *General.* The office of the Association is in the same location and of the same area as a year ago. The office personnel also remains unchanged at three men and five women employees in addition to the Executive Secretary. Office equipment has been well maintained and replacements made as part of a program designed to keep all equipment in an up-to-date condition to serve the needs of the organization. Latest additions in the line of equipment are an electric typewriter for multiple-copy and stencil work and a new Addressograph to handle journal and other mailings. The latter is the most expensive piece of machinery in the office and replaces an earlier model which had served for some fifteen years; the new machine is considerably more efficient than the old model and its cost will be somewhat offset, indirectly, in its increased output.

The office is maintained not only as a place of business but as a center of service for members of the Association and for all physicians seeking aid in any of a number of matters. Office policy is to extend every possible assistance to all physicians and this policy has been maintained in the past year. The door is always open.

2. *Meetings.* The Executive Secretary has attended all meetings of the Council and the Executive Committee and has drafted the minutes of each. He has presided over all meetings of the Advisory Planning Committee and has attended meetings of the Committee on Advertising, Committee on Industrial Medicine and other standing and special committees. He has served as secretary, by request, of the Committee on Constitution and By-Laws. He has also served as an aide to the Association's delegation to the American Medical Association and has attended the annual and interim sessions of the A.M.A. In addition, he has served as executive secretary of The United Public Health League and in the year just past as secretary-treasurer of The Conference of Presidents and Other Officers of State Medical Associations. He has been pleased to cooperate with the Editor in the preparation and conduct of the Annual Conference of Secretaries and Editors of State Medical Associations, sponsored by the A.M.A.

The Executive Secretary has also appeared on the programs of several county medical societies, by invitation, and as a guest speaker before several service clubs or civic organizations and one national trade association group. His appearances also include representation of the Association before the Industrial Accident Commission of the State of California and before committees of the State Legislature.

3. *Financial.* The finances of the Association, conduct of which is delegated to the Executive Secretary by the Council, have continued to show improvement during the past year. A complete financial report for the fiscal year ended June 30, 1948, is shown under the report of the Treasurer and repetition is not required here. Suffice it to say that the budget adopted by the House of Delegates has been faithfully followed and that expenditures were well within the budgetary allowances, that the excess of receipts over expenditures for the June 30, 1948, fiscal year was $198,930 for the Association and $18,659 for the Trustees of the California Medical Association, and that the holdings of U. S. Government securities were increased by $200,000 during calendar year 1948. The Association has ample cash on hand or in short-term Government bills to meet all budgeted and foreseeable obligations. Expenditures for public relations purposes have been considerably decreased from the preceding two years' level and the dues of members have declined from a level of $100 in 1947 to $60 in 1948 and $50 in 1949. The reduced level of dues has provided sufficient funds to take care of the Association's growing activities and needs and to allow an accumulation of surplus for purposes to be determined by future meetings of the official bodies of the Association.

California Medicine, the official journal, was rearranged financially during 1948 through the inauguration of a strict cost-accounting system. Under this arrangement the journal is charged with rent, all clerical salaries, and all direct purchases and obligations, and is credited with the $3 per year per member subscription rate required by postal regulations. This accounting system for the final six months of 1948 indicates that the journal will pay its own way, financially, for the 1949 fiscal year and will probably return a modest profit. Journal expenses have been rising steadily in the past four years, sometimes at an alarming rate, but in recent months there have been indications that some major items of expense, notably printing, have leveled off or actually declined.

Every attempt is being made to keep the journal expenses within the budget and to conserve journal finances as much as possible, consistent with production of a high-grade publication which will be not only of service but a source of pride to the members of the Association. The policy of the Council and the House of Delegates has been to bring out a worthy scientific publication and not to strive for profits. In this connection it is to be noted that the journal pays no commissions to any employee of the Association, the only commission deducted from gross advertising revenues being the commission regularly allowed to recognized advertising agencies by general and special publications throughout the country. All expenses of the journal are now segregated and all revenues credited, so that the financial showing which will appear in forthcoming audited reports will represent the actual results of a business enterprise carried on within the organizational limits of the Association.

4. *California Medicine.* The paragraph above makes comment on the financial and policy aspects of the official journal. Operational considerations include public acceptance of the journal, advertising solicitation and screening, and general policy items for future consideration.

In the public eye, it is safe to say that California Medicine is continuing to gain in stature. The journal is being quoted with greater regularity and is receiving an increasing number of complimentary remarks which attest the able manner in which it is edited. Dr. Wilbur, as editor, was honored last year by appointment as chairman of the planning committee and presiding officer at the Annual Conference of Secretaries and Editors of State Medical Associations, sponsored by the American Medical Association. The editor has followed a policy of constantly considering changes in format, presentation and origin of editorial material, so that the journal does not remain static but stretches at all times to become more useful to its readers.

Advertising solicitation continues under the program reported last year, under the direction of an advertising manager. All new advertising material comes under the scrutiny of an advertising committee, which screens all products and advertising copy, accepting that which meets specified minimum standards and rejecting that which is considered substandard. This committee has been completely diligent and careful in its work and has been effective in setting up advanced standards of medical advertising for numerous national advertisers. The Executive Secretary sits with this committee as liaison between the committee and the Council.

5. *Committee on Industrial Practice.* The Executive Secretary has met with the Committee on Industrial Practice in its work on preparation and establishment of an up-to-date adequate schedule of fees for medical and surgical services in industrial accident cases. A similar schedule was prepared in 1942 and, after a protracted series of meetings, conferences and compromises, was put into effect by the Industrial Accident Commission of the State of California on November 1, 1946. The Committee in 1948 sought to bring this schedule up to date; it prepared a proposed new schedule, which was approved by numerous medical and surgical specialty groups and by the Council of the Association. This schedule was presented to the Industrial Accident Commission on September 1, 1948, and the Commission tabled the petition for adoption of the proposed new fee schedule on the ground that the Commission lacked specific legal authority to make and enforce such a schedule. The Council of the Association thereafter approved the mailing of the proposed schedule to all members, with the suggestion that the proposed fees be put into effect February 1, 1949. The Executive Secretary has been engaged in this program throughout and will continue to carry out his instructions in furtherance of the Council's decisions.

6. *Public Policy and Legislation.* The Executive Secretary has been pleased to give every possible assistance to the Committee on Public Policy and Legislation. This is a legislative year and from the mass of proposed legislation offered in the opening weeks of the State Legislature, it appears there will be a large amount of work required in the months to come.

7. *Public Relations.* This activity was handled again in 1948 by outside public relations counsel, although additional work has been done within the structure of the Association. Through the studies of the Committee on Medical Economics, in which the Advisory Planning Committee has cooperated, it is hoped that a statewide plan of public relations for individual physicians may be worked out in the near future.

8. *Advisory Planning Committee.* The Executive Secretary continues to serve as chairman of the Advisory Planning Committee, a brief report of which is found elsewhere in this issue of the journal. This committee has continued to give consideration to a variety of matters for the betterment of the Association and its component units, subject at all times to the wishes of the Council in putting suggested programs into effect.

9. *Annual Session.* Plans are now well under way for the 1949 Annual Session. The technical exhibit this year will be larger than ever and a start will be made toward the reestablishment of scientific exhibits and medical motion pictures.

10. *Conclusion.* The Executive Secretary wishes here to express his sincere thanks to the members of the Association, the officers and committeemen, and all others with whom he has had the opportunity of working in the past year. Special thanks go to the elected officers and Councilors, under whose direct supervision the Executive Secretary performs his duties. The Council has at all times been extremely cooperative, instructive and helpful and the work of the office has been materially aided thereby. The same applies to the Secretary and the Editor, appointed officers, with whom the writer enjoys most cordial working relationships. The cooperative attitude of all these makes the work of the office not only more effective but a pleasure.

To the office staff, thanks are also due from the Executive Secretary and the Association as a whole. Loyal, efficient and friendly staff members contribute greatly to smooth operations, and this type of service is gratefully recognized.

Respectfully submitted,
John Hunton, *Executive Secretary*

REPORT OF THE TREASURER

To the President and the House of Delegates:

The duties of the Treasurer of the Association are nominal only, the actual duties of the office being performed by the office staff and the audit of accounts by an independent certified public accountant. In his annual audit, the independent accountant checks the receipt and expenditure of all funds, verifies the appropriations for specific purposes by reference to the budget adopted by the House of Delegates and resolutions adopted by the Council, and certifies the presence of cash, securities and other assets shown in the final report.

Submitted herewith is a series of accounts prepared by Hood & Strong, Certified Public Accountants, covering receipts and disbursements of funds for the fiscal year July 1, 1947, to June 30, 1948. These accounts reflect the transactions of the California Medical Association and the Trustees of the California Medical Association, the corporate holding company established by the Association some years ago to hold reserves accumulated by the Association. The tables show income and expense accounts of both organizations, balance sheets of both as of June 30, 1948, and a combined balance sheet of both as of the close of the fiscal year. Members are urged to study both sets of accounts for a true picture of the Association's financial position. The corporation is wholly owned by the Association.

Respectfully submitted,
L. Henry Garland, *Treasurer*

CALIFORNIA MEDICAL ASSOCIATION
San Francisco, California

STATEMENT OF INCOME AND EXPENDITURE
Comparative for Years Ended June 30, 1947 and June 30, 1948

INCOME	Year Ended		
Dues and General:	June 30, 1947	June 30, 1948	Increase (Decrease)
Membership Dues—Less Portion Allocated to Journal Subscriptions	$798,225.50	$531,607.00	($266,618.50)
Exhibitors at Annual Meeting	11,845.00	12,010.00	165.00
Interest Earned	3,674.71	7.53	(3,667.18)
Miscellaneous		56.72	56.72
	$813,745.21	$543,681.25	($270,063.96)
Official Journal—*"California Medicine"*:			
Advertising	$ 71,923.54	$ 67,502.76	($ 4,420.78)
Members' Subscriptions—Allocated from Dues	24,687.00	27,978.00	3,291.00
Cash Subscriptions	1,598.80	1,759.70	160.90
Reprints		367.64	367.64
	$ 98,209.34	$ 97,608.10	($ 601.24)
Total Income	$911,954.55	$641,289.35	($270,665.20)
EXPENDITURE			
Administration	$106,880.19	$121,578.66	$ 14,698.47
Scientific, Educational and Public Relations	288,795.44	232,229.05	(56,566.39)
Official Journal *"California Medicine"*	83,047.97	88,551.52	5,503.55
Total Expenditure	$478,723.60	$442,359.23	($ 36,364.37)
Excess of Income Over Expenditure	$433,230.95	$198,930.12	($234,300.83)

CALIFORNIA MEDICAL ASSOCIATION
San Francisco, California

STATEMENT OF EXPENDITURE
Comparative for Years Ended June 30, 1947 and June 30, 1948

	Year Ended		
Administration:	June 30, 1947	June 30, 1948	Increase (Decrease)
Salary—Executive Secretary	$ 12,333.32	$ 14,333.26	$ 1,999.94
Salaries—Administration	3,660.00	4,925.00	1,265.00
Salaries—Clerical	9,649.71	12,464.37	2,814.66
Traveling:			
Executive Secretary—Secretary	396.81	1,329.80	932.99
Officers	55.06	579.43	524.37
Council	3,864.46	4,566.50	702.04
Executive Committee	415.59	304.87	(110.72)
Delegates to A.M.A.	13,666.15	10,300.85	(3,365.30)
Taxes—Social Security	606.02	465.45	(140.57)
Annual Meeting Expense	13,567.12	19,946.12	6,379.00
Legal Expense:			
Retainer Fee	6,000.00	6,000.00	
Other Legal Expense	5,204.38	3,631.87	(1,572.51)
Pensions	4,740.00	4,740.00	
Office Equipment Purchased	3,055.14	2,102.47	(952.67)
Rent	6,188.85	6,771.11	582.26
Office Supplies and Expense	3,619.22	3,228.21	(391.01)
Postage	482.33	484.48	2.15
Telephone and Telegraph	1,163.02	2,207.04	1,044.02
Council and Executive Committee Expense	2,000.69	2,208.64	207.95
Contributions to United Public Health League	15,169.11	20,119.56	4,950.45
Miscellaneous	293.21	119.63	(173.58)
Woman's Auxiliary	750.00	750.00	
	$106,880.19	$121,578.66	$ 14,698.47
Scientific, Educational and Public Relations:			
Department of Public Relations	$178,863.12	$160,636.63	($ 18,226.49)
Public Policy and Legislation	46,971.24	39,625.97	(7,345.27)
Department of Public Relations—C.P.S.	44,342.36		(44,342.36)
Physicians Benevolence	8,120.00	9,512.00	1,392.00
Postgraduate Activities	111.50	4,956.46	4,844.96
Cancer Commission	2,681.27	5,721.95	3,040.68
Other Committee Activities	3,645.95	4,693.08	1,047.13
Medical Economics		2,326.96	2,326.96
Subscriptions to Libraries	4,060.00	4,756.00	696.00
	$288,795.44	$232,229.05	($ 56,566.39)
Official Journal—*"California Medicine"*:			
Production Expense	$ 71,467.00	$ 74,432.03	$ 2,965.03
Selling Expense	4,952.74	6,360.93	1,408.19
Postage, Wrapping and Mailing	3,537.02	4,377.34	840.32
Illustrations	1,165.94	1,218.85	52.91
Supplies and Office Expense	1,314.08	1,342.98	28.90
Discounts and Collection Expense	264.15	819.39	555.24
Reprints	347.04		(347.04)
	$ 83,047.97	$ 88,551.52	$ 5,503.55
Total Expenditure	$478,723.60	$442,359.23	($ 36,364.37)

CALIFORNIA MEDICAL ASSOCIATION

San Francisco, California

BALANCE SHEET—JUNE 30, 1948

ASSETS

CASH			$282,680.25	
In Banks		$281,362.96		
Commercial Accounts	$280,741.66			
Savings Accounts	621.30			
On Hand		1,281.25		
Petty Cash Fund		36.04		
ACCOUNTS RECEIVABLE			7,720.54	
Journal Advertisers—Total		1,212.39		
Less Reserve for Doubtful Accounts		500.00		
		712.39		
State of California—Department of Public Health		5,836.66		
Miscellaneous		1,171.49		
LOAN RECEIVABLE			0.00	
New Mexico Physicians Service:				
Total		17,500.00		
Less Reserve		17,500.00		
TRUST FUNDS			12,128.16	
Morris Herzstein Bequest		4,033.32		
Benevolence Fund		8,094.84		
FURNITURE AND FIXTURES—Nominal Value			1.00	
DEFERRED CHARGES			761.05	
Prepaid Rent		539.03		
Prepaid Postage		222.02		
DEPOSITS			625.00	
United Air Lines		425.00		
Post Office		200.00		$303,916.00

LIABILITIES

ACCOUNTS PAYABLE		$ 16,393.44	
Journal Production—Accrued Expense	$ 5,303.23		
Other Accrued Expense	6,775.04		
American Cancer Society	2,564.48		
County Societies	690.00		
Collector of Internal Revenue	1,060.69		
TRUST ACCOUNTS		12,128.16	
Unexpended Balance of Income Received under Morris Herzstein Bequest	4,033.32		
Benevolence Fund	8,094.84		
SURPLUS		275,394.40	$303,916.00

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

STATEMENT OF INCOME AND EXPENDITURE

Comparative for the Years Ended June 30, 1947 and June 30, 1948

	Year Ended		
INCOME	June 30, 1947	June 30, 1948	Increase (Decrease)
Interest on Bonds	$ 3,110.23	$ 18,773.80	$ 15,663.57
Interest on Savings Accounts	70.53	100.60	30.07
Miscellaneous	1.00	40.00	39.00
TOTAL INCOME	$ 3,181.76	$ 18,914.40	$ 15,732.64
EXPENDITURE			
Premium on Bonds purchased		$ 93.75	$ 93.75
Audit Fee	$ 126.00	130.00	4.00
Miscellaneous	31.00	31.00	
TOTAL EXPENDITURE	$ 157.00	$ 254.75	$ 97.75
EXCESS OF INCOME OVER EXPENDITURE	$ 3,024.76	$ 18,659.65	$ 15,634.89

CALIFORNIA MEDICAL ASSOCIATION

AND

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

COMBINED AND COMPARATIVE BALANCE SHEETS

ASSETS	California Medical Association	Trustees of California Medical Association	Combined June 30, 1948	Combined June 30, 1947	Increase (Decrease)
Cash	$282,680.25	$ 4,996.63	$ 287,676.88	$ 253,090.45	$ 34,586.43
Marketable Securities	———	865,000.00	865,000.00	700,000.00	165,000.00
Accounts Receivable	7,720.54	9,840.62	17,561.16	13,752.25	3,808.91
Loan Receivable	17,500.00	———	17,500.00	10,500.00	7,000.00
Endowment Fund	———	268.62	268.62	264.98	3.64
Benevolence Fund	8,094.84	22,317.25	30,412.09	22,094.05	8,318.04
Trust Fund	4,033.32	———	4,033.32	3,859.84	173.48
Furniture, Equipment, Etc.	1.00	———	1.00	1.00	———
Deferred Charges	761.05	———	761.05	850.49	(89.44)
Deposits	625.00	———	625.00	425.00	200.00
	$321,416.00	$902,423.12	$1,223,839.12	$1,004,838.06	$219,001.06

LIABILITIES—RESERVES AND SURPLUS					
Accounts Payable	$ 16,393.44	———	$ 16,393.44	$ 23,008.56	($ 6,615.12)
Members' Contribution to Endowment Fund	———	$ 268.62	268.62	264.98	3.64
Benevolence Fund	8,094.84	22,317.25	30,412.09	22,094.05	8,318.04
Trust Account	4,033.32	———	4,033.32	3,859.84	173.48
Reserve for Loan Receivable	17,500.00	———	17,500.00	10,500.00	7,000.00
Surplus	275,394.40	879,837.25	1,155,231.65	945,110.63	210,121.02
	$321,416.00	$902,423.12	$1,223,839.12	$1.004,838.06	$219,001.06

TRUSTEES OF CALIFORNIA MEDICAL ASSOCIATION (A CORPORATION)

San Francisco, California

Balance Sheet—June 30, 1948

ASSETS				
Cash			$ 4,996.63	
Commercial Account		$ 981.88		
Bank of America, N. T. & S. A.	$ 981.88			
Savings Accounts		4,014.75		
Bank of America, N. T. & S. A.	1,274.37			
American Trust Company	1,492.37			
Wells Fargo Bank & Union Trust Co.	1,248.01			
Bond Interest Coupons Due and On Hand			9,840.62	
Investments			865,000.00	
U. S. Government Bonds at maturity value		865,000.00		
Endowment Fund			268.62	
Bank of America, N. T. & S. A., Savings		268.62		
Benevolence Fund			22,317.25	
Crocker First National Bank, Savings		22,317.25		$902,423.12

LIABILITIES AND SURPLUS				
Members' Contribution to Endowment Fund			$ 268.62	
Benevolence Fund			22,317.25	$ 22,585.87
Surplus				879,837.25
Representing the amount by which the Total Assets exceed the Liabilities as of June 30, 1948:				
Contributed Surplus:				
California Medical Association			781,775.28	
Balance, July 1, 1947		$631,000.00		
Additional, April, 1948		150,775.28		
Earned Surplus			98,061.97	
Balance, July 1, 1947		79,402.32		
Add, Net Income for Fiscal Year ended June 30, 1948		18,659.65		

REPORTS OF DISTRICT COUNCILORS

FIRST COUNCILOR DISTRICT

Imperial, Orange, Riverside, San Bernardino and San Diego Counties

To the President and the House of Delegates:

The component societies of the First Councilor District are all in excellent condition. The membership in each Society continues to grow, and the meetings are well attended.

Although the threat of socialized medicine again appears to be imminent at the state and national levels, all we have learned to date from Ben Read and Clem Whittaker indicates that the situation is well met, and it is our feeling that the chances are excellent that nothing really damaging to the profession will develop in the present sessions of the Legislature and Congress.

It is of paramount importance to each member of the society to be informed as to the progress of all political measures and for this reason the members are urged to attend not only the county medical meetings, but a special effort should be made to attend the meeting of the California Medical Association at the Biltmore Hotel at Los Angeles. Members are particularly urged to visit the meetings of the House of Delegates in order to gain a full knowledge of the proceedings of the House, and be brought up to date as to the present status of the political situation.

Your Councilor has endeavored to carry out the instructions and wishes of the House of Delegates and those of the county societies of the First District.

Respectfully submitted,
John D. Ball, *Councilor,*
First District

SECOND COUNCILOR DISTRICT

Los Angeles County

To the President and the House of Delegates:

Your Councilor for the Second District has attended all of the California Medical Association Council meetings for the past year, the minutes of which have been published in California Medicine at regular intervals for your study.

Again I wish to urge all members of the California Medical Association to read carefully all communications coming from the Association. Important subjects are discussed in the news letters and journals, and unless the membership at large read these reports and communications, they cannot hope to be well-informed and able to assist our Association in turning back the tide for compulsory health insurance. The California Medical Association is one of the largest associations in the United States, meeting once a year. It directs the Council through the action of the House of Delegates. Thus, it is of importance that each member of the Association attend all of the annual House of Delegates meetings. It is even of greater importance that all county, branch, and hospital officers attend these meetings.

Respectfully submitted,
Jay J. Crane, *Councilor,*
Second District

THIRD COUNCILOR DISTRICT

Kern, San Luis Obispo, Santa Barbara, Ventura and Inyo-Mono Counties

To the President and the House of Delegates:

The component societies of the Third Councilor District have gained much in membership since the close of the war. Owing to the increase in population in the area there does not seem to be any over-supply of physicians in any of the counties.

The societies are all active and thoroughly conversant with the problems confronting the medical profession at the present time. I feel sure that when called upon they will be a potent factor in keeping the practice of medicine on its present level.

Respectfully submitted,
H. E. Henderson, *Councilor,*
Third District

FOURTH COUNCILOR DISTRICT

Fresno, Madera, Kings, Tulare, Merced, Mariposa, Calaveras, San Joaquin, Tuolumne, and Stanislaus Counties

To the President and the House of Delegates:

The Fresno County Medical Society has secured the efficient services of Mr. Glenn Gillette as executive secretary. A broad program for improving public relations and other activities of the society has been adopted. Tulare and Kings counties have indicated a desire to participate in this program.

The threat of regimentation in some form of State or Federal practice of medicine is resented by the membership and hearty cooperation to oppose any such scheme is assured.

The duties of the Councilor have been given due consideration and attention.

Respectfully submitted,
A. E. Anderson, *Councilor,*
Fourth District

FIFTH COUNCILOR DISTRICT

Monterey, San Benito, San Mateo, Santa Cruz and Santa Clara Counties

To the President and the House of Delegates:

During the past year there has been a large increase in the number of doctors in the district. County medical society meetings are better attended than formerly and there has been a lot of activity in each society.

Hospital construction is increasing. San Mateo County has voted bonds for three new hospitals—one at Redwood City (the Sequoia Hospital District), one in San Mateo (the San Mateo-Burlingame Hospital District) and a county tuberculosis hospital. Santa Clara County has obtained a new emergency hospital to be staffed by members of the County Medical Society and financed jointly by the City of San Jose and the County of Santa Clara. San Benito County has gone ahead with a reorganization of its county health set-up. It would appear that more medical men are becoming conscious of their social and political responsibilities to their respective communities and are entering actively into the solution of local health problems. This has been a very marked phase of medical activity this year in the Fifth District.

Respectfully submitted,
Hartzell H. Ray, *Councilor,*
Fifth District

SEVENTH COUNCILOR DISTRICT

Alameda and Contra Costa Counties

To the President and the House of Delegates:

The Alameda County Medical Association believes it is now meeting its full public responsibility.

Through its various committees and agencies a high quality of medical care is made available to everyone in the county, regardless of the day, the time, the fee, the ability of the patient to pay, or any other circumstance. This fact is being presented to the public through the various media of publicity: paid newspaper advertisements, newspaper stories, special events, radio, pamphlets, pictures, posters, etc.

This guarantee of a high quality of medical care to everyone is implemented by the association's Bureau of Medical Economics, a full-time qualified medical social service worker employed by the Association, the fee complaint committees, the ethics committee, the malpractice program, a part-pay plan in cooperation with Highland-Alameda County Hospital, a 24-hour telephone answering service, promotion of the voluntary health insurance plans, but primarily by the high ethical standards maintained by its members in maintaining good doctor-patient relations.

The Alameda County Medical Association headquarters, the Bureau of Medical Economics, and the blood bank have been moved to 354 Hobart Street, Oakland, where there is ample space for these expanding activities, which now have 40 full-time employees. The blood bank delivers 1,000 units of whole blood monthly. The Bureau's gross exceeds $150,000 a year. Most of the members of the association are covered by its malpractice insurance program, and make constant use of the legal and advisory preventive service offered. The expanding activities of the Alameda County Medical Association constantly open new vistas for valuable service by a county medical society. These facilities are available to the members of the Contra Costa County Medical Society. The latter is giving consideration to the establishment of its own plan.

Respectfully submitted,

Donald D. Lum, *Councilor,*
Seventh District

EIGHTH COUNCILOR DISTRICT

Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo and Yuba Counties

To the President and the House of Delegates:

During the past year I have attended all meetings of the Council. Most of the county societies comprising the Eighth District have been visited and an attempt made to keep the members informed of the policies and problems of the C.M.A. which affect county society activities.

Many new doctors continue to locate in Northern California and adequate numbers of physicians are available in all sections of the 18 counties comprising this district. There are, however, numerous areas in need of modern and expanded hospital facilities. Under the leadership of the local medical profession an attempt is being made to meet this need in Alturas, Gridley, Roseville, Sacramento and several other areas.

A blood bank serving Sacramento, adjoining communities, and a portion of the valley north was opened during the year. This was sponsored by the Sacramento County Society and represented a joint contribution by local labor unions, building supply dealers and doctors. This project has enjoyed enthusiastic community support and again demonstrates the desirable alternative to the dictation of the Red Cross sponsored blood bank program of "free" money for establishment, "free blood," etc.

Practically all eligible and desirable doctors in this district are members of their county societies and cooperation with organized medicine is excellent.

Respectfully submitted,

Wayne Pollock, *Councilor,*
Eighth District

NINTH COUNCILOR DISTRICT

Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Siskiyou, Solano, Sonoma, and Trinity Counties

To the President and the House of Delegates:

During the year 1948 your Councilor visited Marin, Solano, Napa and Sonoma counties only. A four-county meeting was held at Sonoma, California Golf Course on August 26, 1948, about eight foursomes playing golf in the afternoon. Sonoma County Medical Society was host at the dinner meeting, which was attended by about 70 members and guests. Dr. D. H. Murray of Napa was invited to preside at the meeting, during which Dr. Murray and Ben Read spoke at some length concerning our legislative program. John Hunton and Howard Hassard and others were introduced by Dr. Murray, and our President, E. Vincent Askey, was kind enough to come from Los Angeles to be the speaker of the evening. We all enjoyed the dinner and took great interest in Dr. Askey's address.

All county societies in this district are functioning well and have no problems, except the shortage of hospital beds. There now appears to be some question as to the advisability of plumping for more District Hospitals.

Respectfully submitted,

John W. Green, *Councilor,*
Ninth District

REPORTS OF COUNCILORS-AT-LARGE

To the President and the House of Delegates:

In my last report it was stated that the most important problem during the year had been to obtain vigorous action to outlaw secret rebates and commissions.

It is gratifying to report that the Council of the California Medical Association, despite its heavy load of pressing problems, has sponsored a bill which will do much toward eliminating these practices by doctors, whether they are members of our Association or not. In the meantime, improvements have been made in our Code of Ethics for the same purpose.

Respectfully submitted,

Wilbur Bailey, *Councilor-at-Large*

To the President and the House of Delegates:

As one of your Councilors-at-Large and Chairman of the Executive Committee, I have regularly attended the meetings of the Council and Executive Committee the past year. Inasmuch as the minutes of these meetings have been duly published in California Medicine, it is unnecessary to comment on them further. Suffice it to say it is my impression that the Council, as now constituted, has functioned effectively in dealing with the many problems which have arisen during the year. The able chairmanship of Dr. Edwin Bruck has been of enormous value.

Respectfully submitted,

Sidney J. Shipman, *Councilor-at-Large*

To the President and the House of Delegates:

As one of your Councilors-at-Large, I have attended all regular and special meetings of the Council, and meetings of a number of the component county societies.

I am interested in and have worked to keep medicine on its present high standard.

I believe the strongest opposition to state or socialized medicine is for each one to give his best to every individual patient, and to work with and cooperate with his state society in all its activities.

Respectfully submitted,
Walter S. Cherry, *Councilor-at-Large*

To the President and the House of Delegates:

As Councilor-at-Large I have attended all meetings of the Council of the California Medical Association, and have taken an active part on several committees and in general discussions.

I have also attended the Council meetings of the Alameda County Medical Association, in order to further correlate state and county organizations.

It was also my privilege to again attend the annual meeting of the combined Medical Associations of Marin, Sonoma, Napa; and Solano counties.

Respectfully submitted,
H. Gordon MacLean, *Councilor-at-Large*

To the President and the House of Delegates:

During the past year I have served my second year as Councilor-at-Large. During this time I have attended all Council meetings, entered into the discussions and decisions rendered by this body.

It is becoming more and more evident that continued cooperation and "grass-roots" public relations are essential for the survival of free enterprise.

May I again appeal to you to remain united and assist the officers of the California Medical Association.

Respectfully submitted,
Eugene F. Hoffman, *Councilor-at-Large*

To the President and the House of Delegates:

I have attended all meetings of the Council (to the time of writing this report), except for one day during the past year. In my personal and society contacts I have attempted to disseminate the cogent information.

I have found the membership contacted well informed as to what is happening. Some, of course, are more sensitive than others to the seriousness of the present day political trends. What appears to be apathy and indifference is more often an expression of confidence in what they expect the officers of the Association to accomplish.

We believe the best medical care in the world is now available to the people of this country. Each doctor should do his part in telling that to the public.

The sustained efforts of the medical profession and particularly of California Medical Association, toward maintaining a suitable system of medical care for the people of California are necessary.

Each practitioner, in his office, must be a good public relations emissary by treating each patient as a person of dignity, entitled to the best medical care that can be provided at a cost the patient can afford.

For example, it is not necessary to prescribe a large amount of expensive, proprietary labeled product when a smaller quantity, or even a few inexpensive tablets may well do.

The Medical Association as an organized group must sponsor good public relations and must make its weight felt in the field of legislation. We, as an active group of citizens and professional people, are doing the proper thing when we unashamedly take on the task of educating the public and influencing legislation toward the end that third party bureaucratic control will be eliminated, or at least kept in its proper place.

Sizeable amounts of money are required to get results. Generous and appropriate expenditure, I am sure, will be approved by the entire society when spent where needed. It is not only the readers of the medical journals, *Readers Digest*, and *Saturday Evening Post* that need to be reached, but also the great mass of people who read or listen and talk in other circles—and who also vote.

Respectfully submitted,
C. V. Thompson, *Councilor-at-Large*

REPORTS OF COMMITTEES

EXECUTIVE COMMITTEE

To the President and the House of Delegates:

Your Executive Committee has held meetings as occasion demanded to deal with urgent matters which could not wait for regularly scheduled meetings of the Council. The minutes of such meetings have been presented to the Council for approval and have been subsequently published. In general, it has been the aim of the Executive Committee to limit as far as possible the burden of the work of the Council itself and to filter the essential from the non-essential matter which might otherwise occupy the Council's time.

Respectfully submitted,
Sidney J. Shipman, *Chairman*

COMMITTEE ON ASSOCIATED SOCIETIES AND TECHNICAL GROUPS

To the President and the House of Delegates:

There have been no meetings of the Committee during the past year and no communications have reached me as chairman of the Committee from the California State Nurses' Association or from any other society or technical group.

Respectfully submitted,
Robert A. Scarborough, *Chairman*

AUDITING COMMITTEE

To the President and the House of Delegates:

The Auditing Committee has performed the functions laid down in the By-Laws. The professional audit of the Association's books showed them to be in order and the Committee has submitted its recommendations for the 1949 budget.

Respectfully submitted,
Sidney J. Shipman, *Chairman*

COMMITTEE ON HEALTH AND PUBLIC INSTRUCTION

To the President and the House of Delegates:

The Committee on Health and Public Instruction has attempted to keep in touch with health activities concerning practicing physicians, public health officials, and the general public. While no formal meetings have been held during the past year, the Committee stands ready at all times to assist the Association in the field of health education.

Respectfully submitted,
Orrin S. Cook, *Chairman*

COMMITTEE ON HISTORY AND OBITUARIES

To the President and the House of Delegates:

This year of 1949 should remind the California Medical Association of its history and accomplishments and of the history of medical men in California. Any history, documents or copies of documents should be sent to Dr. George H. Kress, 131 South Rampart Street, Los Angeles 4.

A considerable amount of material has been collected, but it is fragmentary and more assistance from member county societies is needed.

In this connection it should be observed that there is but one set of minutes recording the organization of the California Medical Association at the beginning of this century. It would be a wise procedure, and such is strongly urged by this committee, that the minutes from the beginning of the California Medical Association be microfilmed and preserved for security reasons.

Respectfully submitted,
MORTON R. GIBBONS, SR., *Chairman*

COMMITTEE ON HOSPITALS, DISPENSARIES, AND CLINICS

To the President and the House of Delegates:

This committee has continued to interest itself mainly in the application and development of the Local Hospital District Law in California. It has maintained a liaison with the Association of California Hospitals to study and make recommendations regarding staffing these hospitals. Suggestions have been made and information given to physicians in various parts of the state in regard to planning and organization of hospitals in the rural areas of the state. This has been expedited through close association with the Committee on Rural Medical Service. The conference of representatives from 34 of the 42 local hospital districts, held at Palm Springs, January 7 and 8, 1949, was attended by the chairman. It was recommended to the conference that affiliation of this group with the Association of California Hospitals is deemed advisable. The matter is under consideration by the district hospital group. The allocation of funds by the Bureau of Hospitals of the California State Department of Health has been continuously studied.

Respectfully submitted,
CARROLL B. ANDREWS, *Chairman*

COMMITTEE ON INDUSTRIAL PRACTICE

To the President and the House of Delegates:

The standing Committee on Industrial Practice has had important business and we feel that the end results have been very satisfactory.

Early in the year, in conjunction with the California State Athletic Commission, new physical examination blanks and instructions were prepared to be used before professional boxers entered the ring. Our recommendations were well received by the State Athletic Commission.

During the balance of the year a large amount of work was done regarding the fee schedule for the Industrial Accident Commission. A complete revision of the entire fee schedule was prepared, including fee schedules for specialists. This fee schedule was adopted by the California Medical Association Council at a regular meeting, and at the present time is the schedule recommended to be used by practicing physicians in California in caring for patients under the Workmen's Compensation Act.

At present your committee is interested in the work of a sub-committee, under the chairmanship of Dr. Packard Thurber. A manual for the measurement of permanent disability ratings is to be presented to the Industrial Accident Commission and will probably be completed before this report is given. This work is very important and will bring into focus all the loose ends of ratings for permanent disability which arise out of injuries under the Workmen's Compensation Act. Dr. Thurber has done a marvelous work and deserves a great deal of credit for the time and effort which he has expended, not only in compiling his books, but in cooperating with other members of his committee and the Industrial Accident Commission.

Respectfully submitted,
DONALD CASS, *Chairman*

COMMITTEE ON MEDICAL ECONOMICS

To the President and the House of Delegates:

In 1948 the House of Delegates instructed the Committee on Medical Economics to carry on further investigations of the public relations factors of the individual physician-patient relationship. The Council of the California Medical Association appropriated a sum up to $5,000 to carry out this work. The Committee requested the Alameda County Medical Association to investigate this problem. Mr. Rollen Waterson, executive secretary of the Alameda County Medical Association, is in direct charge of this project, which is well under way.

The purpose of this study is to learn and to disseminate information regarding those practices of individual physicians in their relations with patients which result in good or bad public relations, not only for individual physicians but also collectively for medicine as a whole.

A previous study undertaken in 1947 resulted in an analysis of the causes of delinquent medical accounts, each of which represented a broken physician-patient relationship. The present study will consider the causes of malpractice actions, the causes of complaints filed with the Medical Economics and Ethics committees, the opinions of the many hundreds of patients who make telephone and personal calls to office headquarters, and primarily, the methods employed in the offices of the physicians, particularly those which are served by accountants working out of the Bureau of Medical Economics of the Alameda County Medical Association. Office management procedures are being investigated.

These findings will then be correlated with information already known and compiled in the specialized fields of credit, collection, billing, malpractice, bookkeeping, accounting, office management, and the like. This study should bring forth very valuable information as to why one doctor is successful and another is not. When this work is completed a full report will be given.

Respectfully submitted,
H. GORDON MACLEAN, *Chairman*

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL INSTITUTIONS

To the President and the House of Delegates:

The University of California at Los Angeles is proceeding rapidly with the organization of its School of Medicine. The school will be developed entirely on the campus at Westwood. Dr. Stafford Warren, dean of the school, is appointing his faculty and advises us that the plans for the construction of the Medical School, its laboratories and other teaching facilities are practically complete.

The medical schools in California are faced with a huge task in selecting students for the entering class in 1949. The Selective Service Act of 1948 has stimulated a large number of young students to seek admission to schools of medicine a soon as they meet the minimum qualifications for admission. Military duty for these students will be deferred until they have completed medical school. It is the desire of the Armed Forces and the national headquarters of Selective Service to have a certain percentage of such young men deferred so that their military service may be in the Medical Corps. The schools also are receiving applications from a fairly large number of students whose graduate education was interrupted or interfered with by a period of military duty. It is quite difficult for committees on admission of the medical schools to select the candidates of outstanding promise in the field of medicine from such a large number of applicants.

In order to continue the supply of physicians without interruption, the national headquarters of Selective Service has approved a procedure whereby students who would be eligible for admission to medical school in the classes beginning in the autum of 1950 and the autumn of 1951 may be given provisional acceptances and, therefore, a deferment from military duty under Selective Service until they are finally accepted or rejected for admission to the medical school in their respective classes. National headquarters also has agreed to defer all regularly matriculated students in good standing in medical school until they complete their required medical school courses.

The demand for continuation courses in medicine still continues great. Review or refresher courses and postgraduate training are in great demand and still continue to exceed the facilities and faculties available to give such instruction. These continuation study courses are being given by each of the medical schools in California.

Three of the general hospitals of the Veterans Administration are being operated and staffed by committees and members of the faculty of the five schools of medicine. This, to date, has proven quite satisfactory from everyone's point of view, as it has raised the standard of patient care, provided graduate training for residents, and has also given opportunity for a limited amount of research work in these three centers.

There is under discussion and consideration at Washington, D. C., the possibility of Federal financial support for the medical schools in the United States. Several meetings with representatives of the Association of American Medical Colleges and the Council of Medical Education and Hospitals of the A.M.A. have been held with representatives of the Federal Security Administration. It is our understanding that certain legislation to provide financial support for medical schools is being prepared but, at the time of the submission of this report, no final proposal has been made or legislation introduced into Congress. This is being studied carefully by the medical schools and their respective university administrators and boards of trustees.

Respectfully submitted,
L. R. Chandler, *Chairman*

COMMITTEE ON ORGANIZATION AND MEMBERSHIP

To the President and the House of Delegates:

Besides making a routine report of association membership and its distribution, at the last session of the California Medical Association in San Francisco, the Committee on Organization and Membership was given the additional duty of investigating professional rebates as they affect the professional membership throughout the state. In this report, the committee wishes to submit a statement to the effect that in no county unit within the state has such a problem come up, or at least it has not been called to the attention of the committee.

The committee feels that, with the passage of an anti-rebate bill by the California State Legislature at the present session, the rebate problem will be properly solved by state authorities in any instance wherein a member is found guilty of accepting or giving rebates. Especially at this time, medical practitioners can ill afford to allow themselves to be made targets for adverse publicity by accusations of unprofessional conduct relating to any phase of the practice of medicine.

As noted by the appended statistics from the central office, the Association made a fair growth during the past year. Since the last report, 1,055 new physicians have been licensed in the state, of whom 320 joined the California Medical Association. These 320 physicians represent too small a percentage of the available new men in California who are qualified by training and practice to become a part of an organization which has done so much to aid the practice of medicine in this state and to promote good public relations for its members.

The appended resume of membership broken down by counties follows.

Respectfully submitted,
Carl L. Mulfinger, *Chairman*

C.M.A. County Society Membership Totals For Calendar Year 1948

County Medical Societies	*Membership in 1947*	*Number Licensed Physicians (1947 Directory)*	*Membership in 1948*	*Number Licensed Physicians (1948 Directory)*
Alameda	673	1,062	733	1,134
Butte-Glenn	36	58	43	67
Contra Costa	79	138	104	159
Fresno	175	201	191	204
Humboldt	34	52	44	57
Imperial	25	28	26	33
Inyo-Mono	9	10	8	12
Kern	99	142	103	168
Kings	23	25	26	32
Lassen-Plumas-Modoc	13	23	16	25
Los Angeles	4,038	5,869	3,956	6,316
Marin	66	90	65	101
Mendocino-Lake	24	36	23	38
Merced-Mariposa	27	48	34	58
Monterey	75	116	91	124
Napa	45	68	47	72
Orange	172	228	181	253
Placer-Nevada-Sierra	33	53	39	66
Riverside	87	149	99	156
Sacramento	209	241	219	261
San Benito	7	9	6	9
San Bernardino	192	276	219	281
San Diego	400	630	444	685
San Francisco	1,239	2,009	1,281	2,116
San Joaquin	123	152	138	175
San Luis Obispo	35	41	36	48
San Mateo	135	178	149	211
Santa Barbara	127	167	138	188
Santa Clara	287	366	292	410
Santa Cruz	54	71	53	76
Shasta-Trinity	17	22	14	29
Siskiyou	11	19	11	22
Solano	53	91	61	98
Sonoma	78	103	84	108
Stanislaus	45	70	66	90
Tehama	9	12	8	11
Tulare	60	75	73	78
Ventura	53	95	58	101
Yolo	26	24	24	27
Yuba-Sutter-Colusa	27	33	37	36
Totals	8,920	13,080	9,240	14,135

COMMITTEE ON POSTGRADUATE ACTIVITIES

To the President and the House of Delegates:

This committee has carried on the program of regional postgraduate seminars as authorized by the House of Delegates at its 1948 convention under the direction of Carroll B. Andrews, M.D. Eleven seminars have been held in the past year, prepared in accordance with the general plan of the committee, and tailored to fit specific requests by members of the county medical societies concerned. The attendance at these regional seminars is increasing and the reception improving.

The Postgraduate Committee held a conference with representatives of the medical schools in the state, county medical societies, the Tuberculosis Association, the Heart Association, the California State Department of Public Health and related groups during the California Medical Association convention in San Francisco in April, 1948. Another conference will be held May 11th, 1949, during the California Medical Association convention in Los Angeles, for the purpose of further integrating the common postgraduate interests. A supplementary report of the operation of the postgraduate seminar program is being submitted to the proper reference committee.

Respectfully submitted,
John C. Ruddock, *Chairman*

COMMITTEE ON PUBLICATIONS

To the President and the House of Delegates:

Chapter V, Section 10, Committee on Publications, in the Constitution and By-Laws of the California Medical Association, 1948:

"The Committee on Publications shall consist of three elected members, and ex-officio the Editor, the Associate Editor or Editors, and the Secretary-Treasurer.

"The Committee, subject to the instructions and approval of the Council, shall have authority to arrange for the publication and distribution of the Official Journal of the Association and such other publications as the Council or the House of Delegates may direct; and shall consult with the Editors, and with the secretaries of the component county societies to the end that the scientific and organization work of the Association may be presented to the members of the Association in the best possible manner."

Your committee feels that the scientific and organization work of the Association is presented to the members in the best possible manner.

Respectfully submitted,
George I. Dawson, *Chairman*

COMMITTEE ON SCIENTIFIC WORK

To the President and the House of Delegates:

The Committee on Scientific Work met with the section officers and by correspondence during the year. Amongst other decisions made in connection with the Annual Meeting were the following:

1. The scientific program will be modelled along the general lines of the 1947 and 1948 annual meetings, but a relatively free afternoon will be scheduled on the second day of the meeting. This will give members time to visit the scientific and technical exhibits at greater leisure or to attend local clinics, golf courses, or other milieux of distraction.

2. A paging system will be set up so that members may be given messages; however, members must notify their own secretaries as to their probable location (the section meeting and so forth) in order to facilitate this paging.

3. Members will be asked to wear badges at all times. The Association has grown so large that admission to large *general* scientific sessions shall be *by badge*. A section aide will be requested to monitor attendance at smaller section meetings, on a voluntary basis.

4. Scientific exhibit space will be provided.

5. The question of holding daily panel discussions, wet clinics, hospital clinics and so forth was discussed but decided against at the present time.

6. The Council has authorized the inviting of five official guest speakers to each of the annual conventions. The Committee on Scientific Work, in accordance with the By-Laws, has the duty and privilege of inviting these speakers, subject to Council instructions. Inasmuch as some of the sections have privately invited guests from time to time, and visiting physicians from other states sometimes give addresses or discussion, the Committee decided that formal program publicity regarding guest speakers shall be confined to official invited guests of the Association.

7. The Committee is cognizant of the large amount of scientific fare now offered to physicians in California, notably in connection with annual convention of such groups as the American College of Physicians, the American College of Surgeons, the Radiological Society of North America, and other national associations which meet periodically in this state. In addition, there are refresher courses offered by the medical schools, the special courses and lectures sponsored by such groups as the Cancer Society, the Heart Association, the Trudeau Society, and so forth. It therefore believes it desirable to keep our own annual scientific meeting down to a reasonable number of days, and to attempt maintaining the number of papers to a digestible amount.

8. Some of the other medical organizations in this state have continued to request time for scientific sessions *during* the annual meeting of the California Medical Association. Your Committee believes that at such times it is preferable for scientific papers to be presented before regular sections of the State Association. This prevents conflicting symposia and also makes the papers more readily available for publication in the Association's journal.

The following policy of the Committee on Scientific Work, adopted in 1946 and 1947, is reaffirmed by the present Committee:

a. Medical organizations wishing to hold meetings concurrent with the Annual Meeting of the California Medical Association are requested to plan such meetings so that they do not conflict with the scientific or other programs of the state medical organization. This will usually entail the special society holding its meeting *prior to or subsequent to* the three and one-half days required for the state meeting.

b. Medical organizations wishing to hold a short one- or two-hour organizational meeting *during* the C.M.A. meeting are welcome to do so, with due announcement in the Journal and program, provided no formal scientific session is planned which might conflict with the regular session.

c. Scientific papers prepared by C.M.A. members for presentation in connection with the Annual Meeting should be offered to the appropriate Section of the C.M.A., and thereby be available for publication in the State Journal.

The Committee received with regret the resignation of Dr. William Russell during the end of 1948, and congratulates him on his distinguished teaching appointment in Texas; the Council selected Dr. Robert Dennis of San Jose to serve the remainder of his term of office.

Respectfully submitted,
L. Henry Garland, *Chairman*

REPORT OF EDITORIAL BOARD CALIFORNIA MEDICINE

To the President and the House of Delegates:

The members of the Editorial Board are:

Chairman of the Board:
Dwight L. Wilbur, San Francisco

Executive Committee:
Albert J. Scholl, Los Angeles
H. J. Templeton, Oakland
Edgar Wayburn, San Francisco
Dwight L. Wilbur, San Francisco

Anesthesiology:
William B. Neff, San Francisco
Charles McCusky, Los Angeles

Dermatology and Syphilology:
Paul Foster, Los Angeles
H. J. Templeton, Oakland

Eye, Ear, Nose and Throat:
Frederick C. Cordes, San Francisco
Lawrence K. Gundrum, Los Angeles
A. R. Robbins, Los Angeles
Lewis Morrison, San Francisco

General Medicine:
Maurice Sokolow, San Francisco
O. C. Railsbach, Woodland
Edgar Wayburn, San Francisco
John Martin Askey, Los Angeles
W. E. Macpherson, Los Angeles

General Surgery:
Frederick L. Reichert, San Francisco
C. J. Baumgartner, Beverly Hills

Orthopedic Surgery:
Frederic C. Bost, San Francisco
Hugh Jones, Los Angeles

Thoracic Surgery:
John C. Jones, Los Angeles
H. Brodie Stephens, San Francisco

Industrial Medicine and Surgery:
Rutherford T. Johnstone, Los Angeles
John E. Kirkpatrick, San Francisco

Plastic Surgery:
George W. Pierce, San Francisco
William S. Kiskadden, Los Angeles

Neuropsychiatry:
Karl M. Bowman, San Francisco
John B. Doyle, Los Angeles

Obstetrics and Gynecology:
Daniel G. Morton, San Francisco
Donald G. Tollefson, Los Angeles

Pediatrics:
E. Earl Moody, Los Angeles
William G. Deamer, San Francisco

Pathology and Bacteriology:
Alvin G. Foord, Pasadena
Alvin J. Cox, San Francisco

Radiology:
R. R. Newell, San Francisco
John W. Crossan, Los Angeles

Urology:
Lyle Craig, Pasadena
Albert J. Scholl, Los Angeles

Pharmacology:
Hamilton H. Anderson, San Francisco
Clinton H. Thienes, Los Angeles

Public Health:
George Uhl, Los Angeles
Charles E. Smith, San Francisco

At its one meeting in the past year, the executive committee of the Editorial Board unanimously approved as policy the encouragement of greater production of articles by practicing physicians outside the metropolitan centers by earmarking more space in CALIFORNIA MEDICINE for the publication of such material.

Members of the board reviewed an increasing number of manuscripts during the year. Despite the greater load, many found time and energy to make specific suggestions to authors for revisions which ultimately brought to publication valuable articles which otherwise might not have been fully suitable.

The death of Dr. Lambert B. Coblentz in January of this year caused two vacancies, one on the executive committee of the board and the other in the general medicine section. Dr. Edgar Wayburn of San Francisco was appointed by the Council in March to fill these positions. During the year Dr. Lyle Craig accepted appointment to fill a vacancy in the urology section of the board brought about by the death of Dr. Clark Johnson early in 1948.

Respectfully submitted,
DWIGHT L. WILBUR, *Chairman*

ANNUAL REPORT OF THE CANCER COMMISSION

To the President and the House of Delegates:

The work of the Cancer Commission has required meetings of the Commission of its executive committee practically every month during the year. At the request of the Department of Health, the Cancer Commission acted as technical advisors in the preparation of the Department's report to the Legislature on cancer and other chronic diseases. This extensive report on cancer was submitted to the Department after review and revision by the Council of the California Medical Association.

The educational film on "The Examination of the Breast for Early Cancer" was finished during the summer. The film has had the approval of the American Medical Association and the American College of Surgeons and has been added to their list of approved films. The narrative for this film was written by Dr. Alson R. Kilgore of San Francisco and the demonstration in the film was by Dr. Eric Larson of Los Angeles. A second educational film in sound and color on "Cancer of the Rectum" is being prepared by Dr. Robert Scarborough of San Francisco.

During the year the Cancer Commission has conducted cancer conferences for the county medical societies in 18 counties. During the month of October many eastern speakers were available for these conferences because of the annual meeting of the American College of Surgeons in Los Angeles. A large number of the members of the California Medical Association have given generously of their time and experience in the conduct of these cancer conferences. All of these meetings have been well attended and many of the county medical societies have requested that they be repeated each year. At present plans are being made for cancer conferences in 30 different counties under the auspices of the local county medical society. Cancer conferences will be available upon request in all counties no matter how small.

Two refresher courses have been held by the tumor board of the Los Angeles County General Hospital during the year. A refresher course in cancer will be held during March in San Francisco.

Two refresher courses for dentists have been held under the auspices of the University of Southern California at the Los Angeles County General Hospital. A refresher course for dentists soon will be held at the University of California.

Through the courtesy of the Editor, the "Cancer Commission Studies" have been appearing regularly in CALIFORNIA MEDICINE. Upon the completion of these chapters they will be compiled in a California Cancer Manual which will be distributed by the California Medical Association. The editorial supervision of this series of "Cancer Commission Studies" has been in the hands of Drs. L. G. Dobson, Clarence J. Berne, Otto Pflueger and John Kenny.

For 17 years the Cancer Commission has conducted preconvention conferences in radiology and microscopic tumor pathology. During these years a large number of valuable microscopic slides have been studied and preserved. The section of pathology of the California Medical Association has requested the Cancer Commission to establish a registry of microscopic tumor pathology to include the cases presented at the semi-annual conferences and conduct a follow-up through the pathologists who have submitted them. The Commission has approved such a registry and has appointed Dr. E. M. Butt, professor of pathology at the University of Southern California, as curator of the registry.

As in former years, the members of the Cancer Commission have acted as members of the board of directors of the California division of the American Cancer Society. That society has grown until it now has 25 different county branches and is putting on the largest program of health education in the state. Insofar as it is within the power of the California Board, this educational program is being conducted on the basis of hope—that is, that *early cancer is curable.*

Dr. Frederick Hook, medical director of the Cancer Commission, has arranged and supervised most of the cancer conferences during the year. Dr. Hook is maintaining close contact with all of the tumor boards in the state and assisting the smaller and newer boards as requested. There are at present approximately 50 functioning consultative tumor boards that are making quarterly reports to the Cancer Commission.

The Commission has received substantial financial support during the year in its educational program from the California Department of Public Health and from the California division of the American Cancer Society.

Respectfully submitted,
LYELL C. KINNEY, *Chairman*

ADVISORY PLANNING COMMITTEE

To the President and the House of Delegates:

The Advisory Planning Committee has met throughout the year, planning its meetings generally to precede the meetings of the Council, to which body the Committee makes its reports. All items on which the Committee has reported or made recommendations to the Council are found in the minutes of the Council, as printed after each meeting in the official journal.

The Advisory Planning Committee has considered and discussed matters of public relations and other items which are before the Association and has given its cooperation to the officers and committees of the Association.

Since the appearance of the last report of the Committee, the membership has been increased by two appointees of the Council. These are Mr. Ed Clancy, field secretary of the Association, and Mr. Glenn Gillette, executive secretary of the Fresno County Medical Society.

Respectfully submitted,
JOHN HUNTON, *Chairman*

C.M.A. BLOOD BANK COMMISSION

To the President and the House of Delegates:

The C.M.A. Blood Bank Commission will be one year old on April 12, 1949. At present it has 14 members, with two new members whose nominations await confirmation by the Council. Only members of the C.M.A. are eligible for election. The commission is composed of men well versed in blood banking. Four general meetings have been held during the year with adequate representation from the entire state.

Our basic program is:

1. To encourage, to promote, to sponsor, and to aid in the establishment of community type, non-profit blood banks in California wherever their establishment is clearly indicated. Control of such banks must be under the local county medical society.
2. To actively promote and strongly encourage high and uniform standards of service. The standards we recognize are those outlined in the Biologics Act of the United States Public Health Department.
3. To plan and foster the training of personnel for blood banks and to serve as a clearing house for information.
4. To sponsor and aid local medical societies in developing "walking blood banks" in sparsely settled areas where it is economically unsound to erect a blood bank. The Rh factor should be determined at the same time as the blood typing.
5. To promote and foster the immediate exchange of ideas and materials, and the dissemination of information relating to blood banking and its technical methodology by education, publicity and research.
6. To plan and foster cooperation and integration of all existing and contemplated blood banks in time of emergency or disaster.
7. To aid other states and the nation in regard to blood products to the limit of our ability when disaster strikes, or when an emergency condition exists.

The Commission has tried, and will continue to strive, to reach a compromise agreement with the National American Red Cross to assure that the best interests of the state will be served. We cannot subscribe to the visionary method of blood banking at present sponsored by the Red Cross—free blood for all and no donor replacement. We believe in adequate blood for all, at cost, and a donor replacement—in other words, a true blood bank. Under our system no one in need has ever been turned away, and the communities are being given one hundred per cent blood coverage.

As of December 31, 1948, the Public Health Department of California announced that the stock of war surplus Red Cross plasma was practically exhausted. This knowledge should have a salutary effect in that it will stimulate and energize medical societies to hasten the establishment of non-profit blood banks in those areas which we deem inadequately served at present. Dependence on gifts often has a stultifying effect on the initiative of those who receive them.

Many meetings have been held with representatives of county medical societies and other interested individuals regarding methods of establishing blood banks. We welcome all such discussions, as well as suggestions and criticisms.

There are at present four community-type blood banks operating in the state, all north of a line drawn west from Fresno to San Luis Obispo. Sacramento County Medical Society opened its bank October 31, 1948. It is functioning most efficiently. Santa Rosa, Bakersfield, Fresno and Ventura are actively engaged in similar plans and policies. Work in these areas should come to fruition in 1949. We also recommend that regional banks be created in Redding, Santa Barbara and San Bernardino. The Los Angeles County Medical Society has appointed a committee to study the county's needs. Some progress has been made and a solution of the complex blood bank situation which pertains to that area may be expected this year. At this time there is only 52 per cent coverage. The need for a coordinated blood bank system in Los Angeles County is great.

A sub-committee on reciprocity, cooperation and uniform standards between existing community banks was appointed November 13, 1948. Much simplification and a great deal of clarification have been gained so far.

The Commission will erect an educational display booth at the meeting of the C.M.A. in Los Angeles.

The Commission is actively engaged in studying existing laws, rules and regulations under which blood banks operate. The great expansion of blood banking, with its many ramifications, calls for a clarification in existing laws, and possible inclusion of new ones in the Medical Code. An amendment to the Biologics Act was proposed by the Commission for presentation before the present Legislature.

The Commission has just received Senate Bill No. 584, which deals with blood banking. The bill will be carefully studied by the Commission and our recommendation relayed to the C.M.A. Council.

Dr. Pinkerton of Honolulu asked for, and received the reciprocal support of California community blood banks. In the event of a major disaster or war we would help the Territory of Hawaii to the limit of our facilities.

The publicity highlight of last year was the excellent "California Caravan" radio show dramatizing the founding of the Irwin Memorial Blood Bank of the San Francisco County Medical Society. The program greatly aided our state plan.

Respectfully submitted,

John R. Upton, *Chairman*

COMMITTEE ON PUBLIC RELATIONS

To the President and the House of Delegates:

The Committee on Public Relations is composed of ex-officio members named in the Constitution and By-Laws; it functions in cooperation with the Council of the Association and has named as its director the Executive Secretary of the Association, who serves under the Council and acts as liaison between the committee and the Council.

During the past year the committee has been inactive, the broad program of public relations inaugurated by the Association several years ago having been under the direct supervision of the Council without the committee intervening. The Council, in turn, has pursued a policy of public relations approved each year by the House of Delegates.

Respectfully submitted,

John Hunton, *Director*

COMMITTEE ON INDUSTRIAL HEALTH

To the President and the House of Delegates:

The Committee on Industrial Health, newly appointed last year, anticipates meeting formally with the Committee on Industrial Practice early in May in Los Angeles, and that at this meeting the agenda will include a delineation of the areas of the activities of the two committees, which have already been outlined informally, and a discussion of topics which are of common interest to both committees.

Your Industrial Health Committee members, through their personal contacts with both official and non-official agencies in the field of industrial health, have had their attention called frequently to the situation regarding "Standing Orders for Industrial Nurses," and are of the opinion that interest in this subject will not abate until some satisfactory method of supplying the desired medical supervision of nurses in industry is found.

The Western Association of Industrial Physicians, the California State Nurses Association, and the Western Association of Industrial Nurses are but three of the organizations interested in this subject. It is anticipated that one or more of these groups may again approach the Council officially in the future on the subject. Legal and legislative features appear to be involved and the over-all picture does concern—at least indirectly, if not directly—institutional and office nurses, and for that reason your Committee on Industrial Health does not feel that it can assume to report on all phases of the subject. We do feel, however, that the problem calls for continued study on our part.

It is our opinion that emphasis should be placed on the fact that the failure of the "Standing Orders for Industrial Nurses" prepared by the Council of Industrial Health of the American Medical Association to win endorsement by the Council of the C.M.A. was not due to any unwillingness of California physicians to assume proper supervision over nurses in industry, but was due to provisions in the California Nursing Act and/or the California Medical Practice Act, which are peculiar to California and are not comparable to those in the many states in which these orders have been adopted. It is our belief that the lag between acts passed some time ago and the recent growth of industry in California resulting in the employment of a greatly increased number of industrial nurses has caused the anomalous situation referred to, and this belief is apparently being more widely accepted by the other interested agencies than it was at the time the matter was originally acted upon by the Council.

Informal discussions, we may report, have also convinced us that the desire for standing orders expressed on the part of the nurses' organizations is prompted entirely by a wish to have effective medical supervision which will justify them in procedures which are commonly accepted as good practice throughout the United States in industry, and that the endorsement of these limited practices will—both by implication, and in fact—conversely discourage the medical liberties taken, whether in industrial establishments, or in institutions, or in private offices by those nurses or lay attendants who neither desire nor seek any reasonable limitations in their activities.

Your Committee at this time has no opinion whether the proper long-range solution of this problem will lie in the endorsement of any set of standing orders for industrial nurses proposed to date or in legislation which would modify either of the existing practice acts as applied to nurses or physicians, or by some other means yet to be explored. We do, however, recommend a continued study of the problem and cooperation with other professional groups if and as such cooperation is requested or its desirability is evident.

Respectfully submitted,

Christopher Leggo, *Chairman*

COMMITTEE ON RURAL MEDICAL SERVICE

To the President and the House of Delegates:

The primary function of the committee in 1948 was the organization and direction of the Second Annual California Rural Health Conference held at Sacramento, October 16, 1948. Through the medium of this conference the medical problems confronting the rural population, the physicians, the hospitals, the health departments and other interested agencies were presented and discussed. A brochure containing the formal addresses of the speakers appearing on the program was published and distributed to the participating organizations, county medical societies and the chairmen of the American Medical Association committee and rural health committees in other states. A summary of the papers presented was prepared and published in *California Medicine,* January, 1949.

Effort will be made during 1949 to project the committee work into the county and regional levels to increase the effectiveness of local health council development. It is felt that this will expedite the solution of many of the rural medical problems at their origin.

Your chairman attended the Fourth Annual National Rural Health Conference in Chicago, February 3, 4, and 5, 1949. The information and material obtained will be of great value in furthering our state and local program.

Respectfully submitted,

CARROLL B. ANDREWS, *Chairman*

COMMITTEE ON CODIFICATION OF MEDICAL ETHICS

To the President and the House of Delegates:

The Ethics Committee has made several suggestions which are incorporated as resolutions to be presented to the House of Delegates, one of which concerns the use of fictitious names by doctors of medicine. Not only is this contrary to the state law in many cases, but it may cause patients to confuse doctors of medicine with charlatans of various types who practice under names such as "diagnostic clinics," "health offices," "basic science foundations," "institutes," etc.

Further attempts to codify the Code of Ethics seemed unwise at this time in view of the extensive overhauling which our parent body, the American Medical Association, is giving this Code with a view to eliminating rebating practices and toward making the Code more effective.

Respectfully submitted,

WILBUR BAILEY, *Chairman*

PHYSICIANS' BENEVOLENCE COMMITTEE

To the President and the House of Delegates:

The Physicians' Benevolence Committee in calendar 1948 disbursed $6,600 in benevolences, of which $6,000 was handled by the Los Angeles County Physicians' Aid Association. As in past years, the bulk of need for aid appears to center in or gravitate to Los Angeles County, and the service of the county organization has been willingly and gladly extended to the committee in meeting the need there. The balance of disbursements during 1948 was made in other counties, payments being made only after a local investigation had been made and the benevolence approved by vote of the Committee.

Receipts of the Committee during 1948 totaled $12,542.52, of which $9,850.00 came from the Association at the rate of $1 per active member and $2,692.52 represented the contribution of the Woman's Auxiliary to the California Medical Association. Again the thanks of the Committee and of the entire Association are due the Woman's Auxiliary for its untiring and continued support of the Committee and its activities. Following payment of the benevolences noted above, the Committee placed in its reserve account, as a permanent sinking fund, the sum of $9,078.00. This fund totaled $22,605.25 as of December 31, 1948, and current funds, available for payment of benevolences, stood at $4,794.84 on that date.

During the year the Committee regretfully accepted the resignation of one of its members, Doctor Robert S. Peers, who had been a member since the inception of the Committee and who had served loyally and effectively at all times. The Committee has been pleased to welcome Doctor John W. Sherrick of Oakland as a successor to Doctor Peers.

Respectfully submitted.

AXCEL E. ANDERSON, *Chairman*

COMMITTEE FOR STUDY OF PROBLEMS OF ALCOHOLISM

Acting under a resolution passed by the House of Delegates at the 1948 Annual Session of the California Medical Association, E. Vincent Askey, M.D., president of the Association, appointed a committee of five physicians to study the problem of alcoholism in California with a view to making suggestions to the State Department of Public Health and to C.M.A. and its members as to ways to meet the problem and help the addict. Members of the committee are Cullen Ward Irish, M.D., chairman, J. Martin Askey, M.D., Hall G. Holder, M.D., George H. Houck, M.D., and Malcolm H. Merrill, M.D.

After a detailed study of economic, social and medical aspects of the problem, results of which are contained in a 67-page typewritten report submitted to the C.M.A. Council, the committee recommended:

1. That physicians give more attention not only to alcoholics who consult them but to alcoholics in families of their patients, with regard to personality problems as well as to pathologic changes resulting from the habit.

2. That beds in county, municipal and private hospitals be made available for patients undergoing treatment for alcoholism.

3. That diagnostic and rehabilitation centers be developed in areas of population concentration for brief hospitalization and treatment and for directing patients to appropriate agencies for further rehabilitation and supervision; that convalescent units for vocational rehabilitation be established: that psychiatric interviews be conducted at these proposed centers so that suggestions may be made to courts or to law enforcement agencies as to the procedure indicated in individual cases.

4. That a broad educational program be developed, including, besides public education, symposiums and lecture courses for physicians in general practice and special training for physicians, psychiatrists, auxiliary personnel (such as psychiatric nurses and social workers) law enforcement workers and others who deal directly with those addicted to alcohol.

5. That active research be undertaken, embracing biochemistry and physiology, psychiatry and treatment as these subjects bear on acute and chronic alcoholism.

6. That a single administrative authority, preferably an agency of the state that can utilize existing agencies for the most part, be made responsible for organizing, developing and operating an over-all program for dealing with the problem of alcoholism.

7. That the costs of putting the recommendations into effect be met by legislative allocation of a portion of revenues from the taxes on production and sale of alcoholic products.

ANNUAL COUNTY MEDICAL SOCIETY REPORTS

FIRST DISTRICT

Imperial, Orange, Riverside, San Bernardino, and San Diego Counties.

John D. Ball, Santa Ana, *Councilor.*

Imperial County Medical Society

The past year saw the opening of a blood bank at the Imperial County Hospital. The County Medical Society has supervision over the blood bank and responsibility for its operation.

Two very instructive postgraduate Seminars for members of the medical society were put on by the C.M.A. under the able supervision of Dr. Carroll B. Andrews, director of Postgraduate Activities.

The society holds its regular meetings the second Tuesday of each month at 8 p.m. at the Imperial County Hospital. The business meeting is followed by a scientific program.

ERNEST BROCK, *Secretary*

Orange County Medical Association

Our association is still suffering from "growing pains." The membership is expected to run over 200 before the end of this year, just double that of the immediate prewar years. We have had to shift our meeting place as the attendance increases, always looking for a bigger hall.

Our major problem at present is the planning for future developments and a more serious public relations program. There is no doubt that we must soon consider the hiring of an executive secretary to take over our many problems. Under consideration now is the combining of our bulletin, credit bureau, and secretary-treasurer's offices under one roof and management.

LLEWELLYN E. WILSON, *Secretary*

Riverside County Medical Association

An annual out-of-town meeting of the Riverside County Medical Association was held at Palm Springs. Dr. Vincent Askey and Dr. Richard Bullis were guest speakers at the 1948 meeting.

The second Monday of each month at 8 p.m. the Association meets at the Mission Inn. A scientific program is presented, and this is followed by a business session.

The secretary of the association publishes a monthly bulletin which is distributed the first week of each month.

CECIL J. LORD, *Secretary*

San Bernardino County Medical Society

We have steadily increased in our membership. At the present time active members number 224, and there are seven retired members.

Interest in the society is keen, and we have a good attendance at our meetings. The programs have been arranged by Dr. Max Goodman. Meetings are usually held once a month at the San Bernardino County Hospital. However, during the past year one of the meetings was held at the Patton State Hospital, where, after a fine dinner, Superintendent Dr. O. L. Gericke presented Tracy J. Putnam, M.D., who gave a program on prefrontal lobotomies.

The postgraduate activities committee presented seminars in December, 1948, at the Riverside Mission Inn, and March 1, 1949, at the Arrowhead Country Club, San Bernardino. These seminars took the place of our regular meetings on that date. They were well attended and we feel that they definitely had something to offer our members.

The society publishes a bulletin each month, with the secretary as the editor. The bulletin contains articles of timely interest, programs of the meetings and items of general interest to the profession. The bulletin is not only self-supporting from paid advertisements, but has made some revenue for the society.

The society is fortunate in having Dr. Arthur E. Varden as president. He will be remembered as having been our secretary for many years, and is well versed with all phases of the problems of the society.

Dr. Walter S. Cherry, district councilor, is always available for advice and help.

We are striving to get the county hospital enlarged. The patient load has tremendously increased, and we feel that additional facilities must be provided. Meetings are being held with the county medical committee, county hospital committee, the medical advisory board, and our county board of supervisors. Some progress will undoubtedly be made in the near future.

CARL M. HADLEY, *Secretary*

San Diego County Medical Society

The San Diego County Medical Society is steadily growing in numbers, now having a combined membership and applicant list of over 525. The routine functioning of the society is being carried on as usual.

The field of public relations has been covered by news items in the local press, radio programs and various contacts with lay groups throughout the city. Our local blood bank is attempting to fulfill the need for transfusions in cooperation with the Navy, Red Cross, and health department.

Various postgraduate courses have been sponsored by the society.

In short, as the need has arisen the society has attempted to express itself and extend itself for the betterment of the profession as a whole.

W. H. GEISTWEIT, JR., *Secretary*

SECOND DISTRICT

Los Angeles County.

Jay J. Crane, Los Angeles, *Councilor.*

Los Angeles County Medical Association

The Los Angeles County Medical Association again, as in 1947, had a large influx of new members in 1948. With a membership in excess of 4,000, it became mandatory to expand the offices and the personnel of the association. The temporary physical facilities housed in a building purchased in 1946 became totally inadequate, leading to a building program—temporary in nature—offering office space suitable for the increased personnel.

The indoctrination program for new members, which has been operating with excellent results for some several years, was continued, and according to the present outlook will remain as a permanent part of association procedures.

The council and board of trustees activities have been directed primarily toward the issues raised by the threat of federal or state medicine. Committees of the association have been very active in their various capacities in attempting to build better public relations for medicine and in finding methods of avoiding bad public relations. Our fee and professional conduct committees—a total of four committees—have been exceedingly active in this respect.

Before the end of the year plans were made to collect as quickly possible the $25 assessment for the American Medical Association. The result of the program developed has proved highly satisfactory during the first few weeks following the sending of statements for this assessment.

A great deal of work in the field of postgraduate activities has been accomplished, especially through the activities of Dr. Louis J. Regan, at breakfast club postgraduate sessions held in the outlying areas of the county.

Much closer contact has been made with various organizations—the Chamber of Commerce, Welfare Council of Metropolitan Los Angeles and its various committees, health departments, etc.

The Los Angeles County Medical Association Research Foundation has been launched, and considerable progress has been made by the Physicians' Aid Association looking forward to the purchase of property on which will be built a home some day for needy physicians and their families.

The Woman's Auxiliary has been very helpful during the year, and very desirous of aiding in any work the Association may engage upon where the Auxiliary's services may be of value.

Finally, financially the Los Angeles County Medical Association is in a most satisfactory condition.

R. O. BULLIS, *Secretary*

THIRD DISTRICT

Inyo-Mono, Kern, San Luis Obispo, Santa Barbara, and Ventura Counties.

Harry E. Henderson, Santa Barbara, *Councilor.*

Inyo-Mono County Medical Society

The year 1948 has given our society some growth in membership. Two new members in a society as small as ours means a 33-1/3 per cent increase in size. We now number eight.

By welcoming the dentists of our area as associate members we have had good meetings. We meet alternately in Bishop and Lone Pine, thus equalizing the travel burden, for our most northerly and southerly members' homes are nearly 275 miles apart.

The new Northern Inyo District Hospital building is nearing completion in Bishop. This is the first district organized under the new California hospital district law. It serves an area of over 5,000 square miles. The organization of its staff is under way. There is a growing sentiment in the southern half of Inyo County for the formation of another hospital district to serve that large area.

The new Industrial Insurance Fee Schedule compiled by our California Medical Association is a fine piece of news to us. It is indeed gratifying to see that, statewide, the medical profession now sees a truth that this society recognized in 1944. At that time we adopted a new fee schedule for industrial accident cases, and we gave an ultimatum to the insurance carriers to the effect that doctors were neither morally nor legally bound to work for obsolete fees, regardless of the pronouncements of any state bureau.

Lloyd S. Bambauer, *Secretary*

Kern County Medical Society

The distinction of being the smallest county medical society in the State of California to have successfully supported a program of public relations requiring the service of a full-time office of executive secretary belongs to Kern County. Starting with a membership of 98 at the time of establishing the office, the society now has a membership of 120 and a year of successful experience, with promises of a bright future.

Following the enactment of a county ordinance providing for a seven-man commission to govern the Kern General Hospital, the society became actively engaged in a drive to follow through with a complete clean-up of the Kern General Hospital administration. Results much beyond expectations were achieved. The way was cleared for a new qualified administrator, and one believed to be so qualified was secured; a visiting staff has been organized, and the morale of the entire hospital has been raised to a fair level. Unless some unanticipated event should occur, the bad name of the Kern General Hospital, earned over many years of turmoil, will be but an incident in the history of Kern County.

The Medical Economics Council, incorporated shortly before the beginning of the year, got well under way. A collection agency was put into operation and an auditing and accounting service was provided for the doctors' offices, all of which services are handled in such a way as to retain an improved doctor-patient economic relationship.

During the year, the medical society sponsored a cancer symposium which, through cooperation with the American Cancer Society, brought outstanding speakers to the community. The University of Southern California School of Medicine extension courses on medical subjects were provided through the auspices of the medical society, so that the doctors of the community might keep abreast of modern trends in medicine. Activities of the medical society office, aside from major functions, included the writing of news releases, preparation of some advertising, the maintenance of a doctor-referral list, through which the residents of Kern County are being educated to call the medical society for reference to a doctor of medicine. A new orientation committee for the purpose of giving new doctors an insight into the purposes of organized medicine and an understanding of its activities in Kern County was activated. Many of the other committees—such as the new hospital committee for bringing a new hospital to Bakersfield and the admittance committee which screens all the new applicants for membership—met many times and accomplished much toward their objectives.

Officers of the medical society during this year of activity were Frederick O. Wynia, president, and John J. Cawley, secretary-treasurer. Elected to office for the year 1949 were Robert A. Patrick, president; John J. Cawley, vice-president; S. W. Iseminger, secretary-treasurer; and to the board of directors, elected as new members, were John E. Vaughan and Frederick O. Wynia.

It is believed that the year 1949 will determine finally whether or not the full-time medical society office and its economics council can be permanently supported by a small society. The need for such an activity is well recognized in Kern County, as in addition to its contribution to the national effort against socialized medicine, there are always one or more acute local problems requiring the all-out effort of the society.

S. W. Iseminger, *Secretary*

Santa Barbara County Medical Society

The Santa Barbara County Medical Society now comprises a total of 149 members. Twenty-three new members were elected during the year 1948; nine members transferred elsewhere. The death toll was unusually heavy this year with five members succumbing, namely Wm. D. Sansum, Harry L. Schurmeier, Wm. J. Mellinger, Paul Scott Hansen, and Jerome G. Schnedorf.

Our meetings are held at 8 p.m. on the second Monday of the month at Bissell Auditorium. The panel of speakers at our monthly meetings included such distinguished men as Drs. Karl F. Meyer, John Cline, Frank L. Gerbode, J. Norton Nichols and Joseph G. Rushton.

One of the highlights of the year's activities was the postgraduate seminar on December 4. A fine panel of speakers was supplied by the California Medical Association Committee on Postgraduate Activities, including Drs. Myron Prinzmetal, Clinton H. Thienes, Lewis T. Bullock, Ralph E. Homann, Jr., and Lewis F. Ellmore. San Luis Obispo and Ventura counties were welcome guests at this meeting.

The Cancer Commission of C.M.A. presented a valuable program of the diagnosis and treatment of various forms of this disease. The evening session was followed by a dinner at Montecito Country Club. The members greeted these scientific programs with lively enthusiasm and the hope for the future is that we have more of this form of education brought to us.

The medical library of Santa Barbara County Medical Society continues to thrive and our members are truly proud of this institution. An additional money grant enabled the society to open a branch library at St. Francis Hospital. We have established a library memorial fund to which donations may be given in memory of a deceased member in lieu of flowers. This plan is quite satisfactory and the memorial contribution has a permanent place in perpetuating the library.

During the year 1948 detailed biographies were obtained and our files are now almost complete with information about each of our members.

The ever-growing S.B.C.M.S. now looks forward to a successful and interesting year in 1949 under the guidance of our new president, Rodney F. Atsatt, and President-Elect Albert H. Elliot. Other officers elected at the December meeting were: vice-presidents at large, A. M. Beekler and L. H. Streaker; secretary-treasurer, D. F. McDowell; delegates, H. E. Henderson (2 years), A. B. Wilcox (1 year), D. F. McDowell (1 year); alternates, R. W. Lambuth (2 years), Max Hammel (2 years), D. H. McNamara (1 year); Council: Rodney F. Atsatt, J. Gary Campbell, Hugh F. Freidell, Lawrence E. Heiges, and David L. Reeves.

Douglas F. McDowell, *Secretary*

FOURTH DISTRICT

Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare, and Tuolumne Counties.

Axcel E. Anderson, Fresno, *Councilor.*

Fresno County Medical Society

The Fresno County Medical Society held eight regular scientific meetings, three special meetings, and one social meeting during 1948. Meetings were well attended and the scientific discussions by out-of-town speakers were well received.

Committees have been active, including those on cancer, blood bank, mental hygiene, draft board advisory, and history.

Nineteen applicants were elected to membership in the society.

The society employed an executive secretary on December 1.

C. S. Mitchell, *Secretary*

Kings County Medical Society

During the past year the Kings County Medical Society has held monthly meetings except during the summer months. The attendance has been very good.

Virginia M. Cobb, *Secretary*

San Joaquin County Medical Society

The San Joaquin County Medical Society has completed a successful year in 1948 under the leadership of Dr. Edmund P. Halley.

Several projects of extreme importance to our members have been successfully concluded:

1. The local blood bank was opened early in 1948. Up to the present time it has never failed to supply blood when called upon. Much of the credit must be given to Dr. Don C. Harrington. He was untiring in his work when the bank was being established and has continued his active interest as representative of this society to the blood bank.

2. We were fortunate that Stockton was chosen for the regional meeting sponsored by the Cancer Committee of the California Medical Association. Arrangements for the meeting were made by the local cancer society under the leadership of Dr. J. O. Eccleston. Specialists from all parts of the country gave beautifully illustrated addresses on cancer as it affects various parts of the body. The meeting was well attended.

3. This was the tenth year of classes of the postgraduate study club. The lectures maintained their usual high standard. As in the past Dr. Charles A. Broaddus was chairman of the committee on arrangements. At the final meeting, Dr. Broaddus requested that some younger man take the burden from his shoulders. As a token of our gratitude for his ten years of outstanding service, Dr. Dewey R. Powell, acting on behalf of the society, presented Dr. Broaddus with a distinguished service key.

4. There has been continued agitation throughout the year for expansion of the medical facilities of the local Veterans Administration office. Our president, Dr. E. P. Halley, has taken an active interest in this program and has consistently tried to prevent the development of any program detrimental to the society. Up to the present no new medical appointments have been made and it seems possible that the whole program of expansion may be abandoned.

The following scientific programs were presented in 1948:

January 8—Psychiatric History Taking, Dr. Paul A. Gliebe.

February 2—Blood Bank Program of the American Red Cross, Dr. Ross I. McIntyre; Blood Fractions, Dr. Foard T. McGinnis; Serum Albumin and Its Uses, Dr. David Rytand.

March 4—Industrial Hygiene and Occupational Diseases, Dr. Rodney Beard.

April 1—The Alleviation of the Fear of Childbirth—Dr. Carl Marsh.

September 2—Radioactive Isotopes and Their Clinical Application, Dr. E. P. Halley.

October 7—Cancer of the Cervix Uteri, Dr. A. Wilson Footer.

November 4—Alcoholism, Dr. Paul A. Gliebe.

December 2—Dermatology in General Practice, Dr. Rees B. Rees, Jr.

There was a net gain in membership of 11, making a total of 134 members.

FRANK A. MCGUIRE, *Secretary*

FIFTH DISTRICT

Monterey, San Benito, San Mateo, Santa Clara, and Santa Cruz Counties.

Hartzell H. Ray, San Mateo, *Councilor.*

San Mateo County Medical Society

The present roster of this society shows 159 active members and 10 associate members. As president for 1949, Dr. Thomas Farthing replaces Dr. Harry Mason; in the secretaryship Dr. Ian Luke succeeds Dr. Logan Gray. Of particular significance relative to the increase of both the county's population and its medical activity is the fact that 26 candidates for Active Membership in the society have filed application during the past year.

The problem of bed-shortage has an outlook for solution in that construction is now going forward on the Sequoia Hospital in Redwood City, and the mid-county situation became more encouraging with the election of last November, when bonds were voted for the Peninsula Hospital.

IAN W. LUKE, *Secretary*

San Benito County Medical Society

The San Benito County Medical Society has been active during the past year with regular meetings held the first Wednesday of each month at the Hazel Hawkins Memorial Hospital in Hollister. The year 1949 was started off with the election of Roswell L. Hull as president and John J. Haruff, secretary. Ralph E. Munson was elected to membership, making a total of seven members. Plans are being made to add educational features to our business meetings.

JOHN J. HARUFF, *Secretary*

Santa Cruz County Medical Society

Under the competent leadership of Dr. Philip K. Gilman, Jr., of Watsonville, this society enjoyed a very successful year. Six regular meetings were held at bi-monthly intervals. All meetings were dinner meetings. In January Dr. Don King of Stanford School of Medicine presented the general subject of Orthopedics. The March meeting had as speaker Dr. Victor Richards of Stanford School of Medicine, who discussed Medical and Surgical Conditions of the chest. In May the society was addressed by Dr. Frank Gerbode of San Francisco on the subject Peripheral Vascular Diseases. The July meeting had as speaker Dr. Windsor Cutting of Stanford School of Medicine, who discussed New Drugs. Dr. Paul Hattersley of San Francisco was with us in September and presented the subject of Anemia. The November meeting, which was also the annual business meeting, had as speaker Dr. Frederick Fender of Stanford School of Medicine, who discussed Intracranial Injuries.

SAMUEL B. RANDALL, *Secretary*

Santa Clara County Medical Society

During 1948 our society's activities have fallen into three main categories. They are:

1. Actions initiated by the organization for the medical benefit of the public.

2. Actions we initiate for the benefit of our own members; and,

3. Actions we became involved in by reason of programs other people or groups initiate.

Presented herewith is a thumbnail summary of current Santa Clara County Medical Society work and objectives segregated into the three different categories listed above:

Actions for the Medical Benefit of the Public—Carrying forth the project to develop the establishment of a local adequate emergency first aid hospital. The preliminary public education and publicity program on the project was keyed constantly to building a conviction that there was no question whatsoever regarding the absolute need for an emergency hospital. When final vote came before both city and county officials, only the methods of financing and the location of the site were the items discussed. During the year the public health committee ably conducted an industrial health survey covering 960 workers in local plants. The final results of the entire project are expected to be presented for publication soon in a national medical journal. Consolidation of our efforts in connection with the local blood bank were completed and, as a result, the constant availability of blood has been more regularly assured. An education program in connection with venereal disease treatment and care has been conducted, in cooperation with the county health department, throughout the entire year. Additional health education programs have been presented by the medical society with weekly radio programs over station KEEN. Twenty-six of these weekly broadcasts were dramatic presentations staged by drama school students from San Jose State College. Since midsummer, the programs have been transcriptions supplied by A.M.A. All have pointed steps to better health. The society has continued to make known its guarantee to fulfill any unmet medical need found to exist in this county. (Medical needs do not include hospital service or drugs.) The known existence of the medical society office affords the public a place where it can seek authoritative and helpful health information. Despite the fact that incoming questions run the gamut from the ridiculous to the sublime, the answers given, nevertheless, have proved reassuring and helpful to the questioners. A recent article in a national women's magazine brought 13 inquiries in one day regarding the medical qualifications of five local obstetricians; an A.M.A. *Journal* article repeated in the *Mercury Herald* created a series of inquiries which persisted for a week after the article appeared. These are but a few items cited as samples of year-round service.

Actions for the Benefit of Our Own Members—The Society's American Mutual malpractice insurance and claims prevention program inaugurated on January 19 this year is perhaps the most dramatic illustration of both the ability and the value of members' cooperating in such a program. This new insurance, now in operation in Alameda (where it began), San Francisco, Santa Clara and Contra Costa counties, is the first of its type in the nation. It is a prevention program which combines group coverage with experience rating. It places greatest emphasis on the prevention of malpractice claims by eliminating their causes through an intensive program of education, and by attempting to meet specific claims at their immediate onset, instead of waiting until they might culminate in a court summons. This insurance is offered to members strictly on the basis that it affords them greater protection. Enrollment continues high in the society's group health and accident plan. Until this society's plan came into existence, only one other medical group had insurance that provided more than one year's coverage for sickness. Our plan provides coverage for two years. Six of our members this year were receiving indemnity payments for periods varying from two to twelve months. More than 60 per cent of our members and their families are enrolled in our Blue Cross hospital insurance. Benefits to members by participation in our Bureau of Medical Economics are well known. Cash savings over commercial rates exceed $6,000 for this year alone. Aids for the doctor's use right in his own office added further to his financial gains as a member of the bureau. The informative article, "Why Patients Don't Pay," published by the bureau in the July issue of our county bulletin, has been copied by 16 state and county bulletins, plus *Medical Economics*. Other aids afforded society members include special time-saving insurance claim forms; "new patient" registration forms; special C.P.S. indemnity-type billing forms; library facilities; and answers to an average of seven questions per day from doctors' offices. Our committee chairmen have taken advantage of special educational facilities to provide programs for our members. One such program, which deserves additional special note, was the symposium on cancer conducted on April 24. Steps toward incorporation of the organization were begun. Special study was made of the possibility of the society owning, building or buying a building of its own.

Miscellaneous Actions—There seemed no end of participation in activities which were not begun or initiated by the society but which proved most time-consuming. In general, they included constantly combatting the encroachment by tax-supported and lay agencies upon the field of private medical service in instances where medical indigency is not a consideration. We engaged, in accordance with local conditions, in helping reduce the instances where medicine was being practiced by profit and non-profit corporations and hospitals. We did our part in the surveillance of rebating and fee splitting which came in for much statewide publicity and consideration last spring. Further time was spent in cooperating, through the aid of our public legislation committee, to carry out locally the legislative interests of our state association; in taking action regarding certification of crippled children fund cases; in studying and sanctioning, in cooperation with San Mateo County Medical Society, a contract proposal for medical care for the Menlo Junior College students; in evaluating and advising interested parties regarding the merits or demerits of certain locally proposed medical and hospital ventures; in appointing doctors to serve on three local draft boards; in assisting the district attorney's office in setting up a panel of doctors to serve in sobriety tests; in campaigning to elect our member, Stanley Kneeshaw, to the high post of President of C.M.A.—the first such election from a "cow county" in many years!

Richard O. Pfaff, *Secretary*

SIXTH DISTRICT

San Francisco County.
Edwin L. Bruck, San Francisco, *Councilor.*

San Francisco County Medical Society

Nineteen forty-eight was the eightieth anniversary of the San Francisco County Medical Society, and the twentieth anniversary of its monthly bulletin. It was also one of the most constructive years in the society's history for the individual members, as well as for the profession.

Press and public relations were greatly strengthened during the year due to the fine work of the committee on publicity. Dinner meetings were held with representatives of the San Francisco newspapers, the news services, the San Francisco hospitals, the schools of medicine of the two universities, and the society.

At these meetings, the problem of medical news for lay consumption was discussed, and a plan was adopted whereby editors of newspapers and managers of news services could secure accurate information from the society's news bureau directed by the executive secretary. The effects of this meeting were evidenced immediately by the marked improvement in the relations between the doctors, the hospitals, the society, and the press.

The society's library was finally disposed of to the medical schools of the three California universities, and their appreciation was expressed many times in the bulletin.

The membership stood firm on the health service system resignations, and the society was not called upon to act as agent for its members during the latter part of the year. In the early months, efforts were made to effect settlements, but without success. Later on, the emphasis shifted from the society to the controversy between the retirement system board and the H.S.S.

The general practice section was started. The scientific meetings were better attended in 1948 than in the previous year. There were worthwhile programs in all the sections. The one joint meeting of the medical and surgical sections was well liked, and the panel discussions of the general meeting were particularly well received. The eye, ear, nose and throat section reorganized into two sections—one for eye and the other purely ear, nose and throat subjects.

The Bureau of Medical Economics again demonstrated its value in bettering the economic relationships between patients and physicians. The membership of the society responded in a most admirable manner to an appeal to join and support the bureau as a means of furthering good public relations.

The Woman's Auxiliary manifested its unique worth as an ally in all the society's activities.

The society is playing an important part in community preparation for disaster, and five members are on the central committee.

Consistent improvement was made in the bulletin. In March, the twentieth anniversary issue was published, representing the largest single issue in the bulletin's history.

During the past year, the health education committee conducted a health seminar for school teachers, in cooperation with the San Francisco District Dental Society, the San Francisco Unified School District, and San Francisco State College. There were 75 school teachers in the course, 26 of whom are receiving college credit, in addition to credit for in-service training, which is accorded to all school teachers taking the course. The speakers in the course have been various members of the society and the district dental society, and others who are specialists in associated medical fields. This course is being carried on in 1949 also.

The health education committee also arranged with radio station KFRC to give the A.M.A. series, "Before the Doctor Comes."

The medical service committee has been active in interviewing the San Francisco civil service medical employees, and studying the various phases of their activities pertaining to a desired salary raise by the civil service commission, and then recommending the raise.

Representatives of the San Francisco County Nurses Association and the nursing profession advisory committee of the society met several times to discuss the shortage of nursing power. A course is now being given under the direction of the unified school district to train "licensed practical nurses" known as "L.P.N." Minimum requirements are two years of high school education, age range 17 to 50 years, length of course one year, to include six months (two semesters) of classroom instruction and six months' hospital experience. Legislation is being prepared to license these practical nurses.

The California Physicians' Service committee of the San Francisco County Medical Society has been named by the Board of Trustees of C.P.S. to be a review committee for that body.

The professional conduct committee of the society considered 67 cases of various natures falling into several general categories: of fee disputes which numbered 29; malpractice suits, 16; questions on advertising, 6; matters of unethical conduct, 12; complaints against hospitals, 2; complaints against undertaking firms, 1; and special investigation, 1.

The professional conduct committee reported that most of these complaints could be avoided by: (1) amiable and frank relations with the patient, plus a willingness to sit down and discuss the issue at hand, and (2) knowledge of the Principles of Professional Conduct as set forth in the Constitution and By-Laws. The committee also reported that in its opinion the actual number of malpractice suits filed and the potential for the filing of suits is greatly increased, and that the sums of money sued for have increased to an alarming degree, commonly ranging in excess of $100,000.

The San Francisco branch of the American Cancer Society continues to account for a large part of the activities of the Society's cancer commission. As in previous years, the members are on the board of directors, and three members are on the executive committee of the local branch.

The society rendered a patriotic duty in cooperating with Selective Service, appointing medical advisors for draft boards and consultants in specialties.

Through the special service fund committee financial assistance was given to four veteran-members of the society. That the fund is still serving a useful function is obvious from the fact that calls are still being received asking for aid; and it is possible, with rising costs, that in the not too distant future there will be increasing rather than decreasing requests.

During the year 1948, the San Francisco County Medical Society lost 18 members by death.

In pursuance of plans suggested in the last annual report the committee on industrial health held several meetings, with the purpose of organizing a program of postgraduate training in industrial health. It is earnestly hoped that this project can be brought to a successful conclusion in the near future.

The committee on admissions recommended 131 new members to the board of directors for admission into the society, an increase in membership of slightly more than 10 per cent over the total 1947 membership.

The society's minifilm examining unit for chest x-rays was established September 1, as a trial project for six months. The purpose of the unit is to conduct a survey on apparently healthy persons in the City of San Francisco, and in time to make certain that the entire population has been x-rayed. This program is being handled in collaboration with the San Francisco Tuberculosis Association.

The blood bank continued to grow and proved a most valuable public relations asset. The total number of donors was 23,420, an increase for the year of 13.4 per cent.

A group malpractice insurance plan was initiated offering the best coverage available at the lowest premiums, and a group accident and health plan was started to protect earning power during disabilities caused by illness or accident.

A hearing center committee was established to represent the eye, ear, nose and throat section for the purpose of aiding and advising the San Francisco Hearing Society in the conduct of a hearing center. The committee set up a fee schedule for private, semi-private and clinic patients. It also met with representatives of the hearing aid dealers with the result that latest-model instruments have been loaned to the center by the local distributors of almost every A.M.A. accepted aid.

The hearing society, a lay group, is an agency of the community chest. It raised the funds to equip and operate the hearing center but looks to the committee of otologists of the county medical society for guidance and control of its operations.

What makes the San Francisco County Medical Society work smoothly is the devotion to their duty of the chairmen and members of these various committees. The accomplishments this year were the result of projects started in previous administrations, and the continued excellent teamwork displayed by the members as well as the officers and directors of the society.

M. Laurence Montgomery, *Secretary*

SEVENTH DISTRICT

Alameda and Contra Costa Counties.
Donald D. Lum, *Councilor.*

Alameda County Medical Association

The Alameda County Medical Association is meeting its responsibilities to the profession and the public through the following activities, programs, projects, and agencies:

Public Service—Active fee complaint committees, the existence of which is advertised to the public.

An unconditional guarantee of medical care to everyone in the county regardless of inability to pay, which is repeatedly advertised to the public, and which is backed by the association's Bureau of Medical Economics, a new social service department with a qualified medical social service worker at the headquarters office, the "part-pay plan" of the association in cooperation with Dr. Otis Whitecotton, medical director of the County Institutions Commission, the uncompensated work of members of the association in county institutions, but primarily by the fact that our members apply to their own practices the principle of medical ethics which places the interest of the patient ahead of financial remuneration.

A 24-hour telephone answering service for providing doctors in emergencies, which service is advertised under the heading "Physicians and Surgeons" in the telephone directory.

Constantly rising standards of practice in approved hospitals.

A militant ethics committee.

The operation of a blood bank which supplies whole blood to the entire community immediately upon request of the physician without any prior arrangement as to replacement or payment for processing charges.

Promotion of voluntary health insurance plans.

Other activities and projects in child health, industrial health, public health, organization for disaster relief, liaison with lay organizations interested in cancer, tuberculosis, heart, etc., control of quacks and irregulars, etc.

Service to Members—Services to members include a malpractice insurance program which is cutting down the incidence of malpractice suits and has reduced the cost of malpractice to less than half; a health and accident insurance program which provides five years of $250 monthly indemnities at low cost; ethical collection service through the Bureau of Medical Economics; medical social service consultation for members; office management consultation service; outstanding scientific programs which attract the attendance of more than 500 of our members; credit reporting; an excellent library, and so forth.

The association has budgeted in excess of $15,000 for publicity on its public service program during 1949.

The association and its agencies now have in excess of 40 full-time lay employees. Dues are $40 for active members, which are returned to members many times in savings on malpractice and health and accident premiums, credits, collections, and other services. The greatest increment to us from our investment of time and money in our accelerated program, however, is our improving public relations as indicated by the decrease of malpractice claims, a decrease in the number of delinquent medical accounts referred for collection, the absence of response to our repeated advertisements in the public press for complaints against members who are guilty of overcharging or other unethical conduct, and the maintenance of the most priceless ingredient of good medical practice in a community—good feeling and the absence of cliques and factions within the profession itself, in spite of our having increased our total membership to nearly 1,000.

The Alameda County Medical Association believes that it is justified in its pride in the contribution it has made to the legislative, economic, public relations, and scientific achievements of California medicine.

Dorothy M. Allen, *Secretary*

EIGHTH DISTRICT

Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo, and Yuba Counties.

Wayne E. Pollock, Sacramento, *Councilor.*

Yolo County Medical Society

The Yolo County Medical Society held regular monthly dinner meetings during 1948 except for the summer months. Recent findings in medicine and related fields were brought to the group through prominent speakers from various parts of California.

In January a cancer clinic was held at Yolo County Hospital through arrangements made by the county cancer committee of the society.

New members admitted during the year are Drs. Charles L. McKinney, Neil D. Elzey, Kayle Fawcett and Thomas Y. Cooper.

Charles L. McKinney, *Secretary*

Yuba-Sutter-Colusa Counties Medical Society

The destinies of our society were guided in 1948 by our only woman physician, Dr. D. Emorine Edwards.

Nine regular meetings were held.

January: a cancer symposium by the Public Health Department, which presented a highly educational evening.

February: A business meeting, relating primarily to the local situation. It was voted to reimburse the delegate and alternate for the expenses of attending the C.M.A. annual meeting, to the extent of $75.

March: "Urology for the General Practitioner" was the theme of the evening lecture.

April: Delegate and alternate gave a detailed report of the C.M.A. Convention. The society again went on record: That the courtesy of free examination be extended to all organizations that provide summer camp vacations in this community. These examinations were made by the family physician.

May: Dr. Ralph C. Burson and Dr. Edmund W. Overstreet of the University of California Medical School gave a detailed presentation on analgesics in childbirth including caudal analgesia.

June: A motion picture, "Postencephalitic Parkinsonism—Signs, Symptoms, and Therapy of the Disease," was shown.

October: Dr. Edwin H. Lennette, chief of the Viral and Rickettsial Disease Laboratory of the California Department of Health, outlined laboratory procedure.

November: Annual society banquet held at Riverside Hotel, Colusa. Guest speaker: Dr. Frances Cox—Fractures of Wrist and Ankle.

December: Wayne E. Pollock, M.D., Councilor for the Eighth District, accompanied by Dr. Frank MacDonald, presented the political situation on the state and national level.

Four new members were elected during the year.

Leon M. Swift, *Secretary*

Sacramento Society for Medical Improvement

Organized in 1868, the Sacramento Society for Medical Improvement has enjoyed steady growth. The society now has over two hundred members, many of whom are active in local and state medical affairs. Meetings are held monthly, at which time speakers, usually from the medical schools in San Francisco, aid in keeping us informed of recent developments. An annual banquet is held March 17, and the December meeting is devoted to election of officers. A history of the society is now in preparation.

Edmund E. Simpson, *Secretary*

NINTH DISTRICT

Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Siskiyou, Solano, Sonoma, and Trinity Counties.

John W. Green, Vallejo, *Councilor.*

Marin County Medical Society

The Marin County Medical Society made a satisfactory showing in 1948. The present membership has reached 71, and several new members will probably come in soon. One member died and one transferred out of the county.

Nine monthly meetings of the society were held. All were well attended and worthwhile subjects were adequately treated in every case.

The old constitution and by-laws had become out of date and a new one was written, revised and accepted. The society is now functioning smoothly under a newly elected board of directors.

Obstetrical cases continue to keep the maternity beds full. The use of Hamilton Field Hospital for such cases has helped to relieve the strain on the other two hospitals.

All the medical specialties are now well represented and seem to be doing a satisfactory job in caring for the needs of the county.

Carl W. Clark, *Secretary*

Mendocino-Lake Medical Society

At the annual meeting of the Mendocino-Lake County Society held at Willits, the officers for 1949 were elected, the president-elect being Dr. E. C. Bennett of Ukiah, secretary-treasurer Dr. Robert B. Smalley of Willits. Dr. Clemens M. Beil, Upper Lake, was elected delegate, with Dr. E. C. Bennett as alternate.

Because of the increased size of the society, it was decided to have monthly meetings except for June, July and August, instead of the quarterly meetings.

Robert B. Smalley, *Secretary*

Napa County Medical Society

Nineteen forty-eight was a good year for the Napa County Medical Society. Due to the return of men from the armed services and others shifting locality, as in the case of those looking for a better location, our membership increased from 44 to 50.

Dr. Walter Brignoli of St. Helena developed into a first-class president and succeeded in having interesting meetings throughout the year.

Our November meeting was held as usual at the Veterans Home where each year the local doctors are welcomed as guests of the home with Colonel Holderman, commandant, and the medical staff entertaining the profession in their fine hospital. At this meeting the annual election of officers was conducted. Dr. M. M. Booth of St. Helena was elected president and Dr. Robert Starr Northrop of Napa secretary. Dr. D. H. Murray was named delegate with Dr. Harry V. Baker as alternate.

With the increase in membership which the past year has shown it is the hope of the society that we will qualify for an additional delegate during the coming year.

Robert Starr Northrop, *Secretary*

Sonoma County Medical Society

Membership of the Sonoma County Medical Society at the end of December 1948 was 84 with eight new members acceptable for membership January 1, 1949. During the year of 1948, 14 new members were accepted. Two members were deceased and three members were transferred.

Ten meetings were held during the year with average attendance of 45 members.

A seminar on "Nonmalignant Gastro-intestinal Disorders and Treatment of These" was held June 18 at the Sonoma County Hospital in Santa Rosa for the members of the Sonoma, Marin, Napa, Mendocino and Lake County societies. This was under the direction of Carroll B. Andrews, M.D., chairman of the C.M.A. Postgraduate Committee.

One of the important undertakings of the society during the year was the sponsorship of a community blood bank for the County of Sonoma. The members voted to underwrite this project with $8,000 on the basis of a $100 loan from each member. Local clubs and organizations and individuals lent their support to this, and the Leghorns Ball Club from Petaluma has extended $2,000 to the blood bank.

William N. Makaroff is chairman of the blood bank committee.

Raimond F. Clary, *Out-going*
Secretary-Treasurer

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Blood Transfusions and the Rh Factor

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SUMMARY

When Rh-negative persons are given transfusions of Rh-positive blood, more than 50 per cent are sensitized to the Rh_0 *factor. Such sensitization of female children may be the cause of hemolytic disease in their offspring many years later, while severe hemolytic reactions may follow a second transfusion of Rh-positive blood in either sex.*

The gross hemolysis of transfused blood may be entirely asymptomatic, however. In one case a pint of blood was completely hemolyzed within two hours without producing symptoms. The only signs were hemoglobinuria, low grade jaundice, urobilinogenuria and a rising Rh antibody titer. The patient had previously been sensitized by a single pint of Rh-positive blood.

The dangers of Rh sensitization can be avoided by routine Rh typing of all prospective recipients of transfusion, whether male or female, and by giving only Rh-negative blood to those who are Rh-negative.

SINCE 1940, when Landsteiner and Wiener[5] first described the newly discovered "Rhesus factor" in human erythrocytes, certain basic facts regarding this factor have become so well established and so generally known as to require only the briefest review:

1. The Rh and Hr factors are a group of antigenic substances which occur in various combinations in the red blood cells of all human beings.

2. These factors are hereditary characteristics determined by corresponding genes, each factor being a simple mendelian characteristic, dominant over its absence.

3. The Rh factors, being antigenic substances, are capable of stimulating the production of type-specific antibodies when cells containing these antigens are injected into receptive individuals or into suitable experimental animals. Antibodies corresponding to each of the known Rh and Hr antigens have been found in the blood of sensitized patients. Sera containing these antibodies are utilized in typing human erythrocytes.

4. A single member of this group of antigens, the Rh_0 (or D of Fisher) has proven by far the most important, probably 99 per cent of all Rh sensitizations occurring among the 15 per cent of persons whose cells lack this antigen. Because of this fact, the anti-Rh_0 (anti-D) serum is known as the routine or diagnostic Rh-typing serum, and patients are classified as Rh-positive or Rh-negative on the basis of the reaction of their cells in this serum.

5. Sensitization of Rh-negative patients to the Rh factors occurs in two ways: First, by transfusion with Rh-positive blood; and, second, by repeated pregnancy and delivery of Rh-positive infants. In the latter case, the fetus receives the dominant Rh-positive gene from the Rh-positive father. It is probable that during the latter months of pregnancy, when the placental villi become progressively thinner, with less of a barrier separating fetal and maternal circulations, some fetal red blood cells, containing the Rh antigen, pass into the maternal circulation, where they stimulate the formation

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From the Department of Medicine, Stanford University School of Medicine, San Francisco.

Read as a part of a Symposium on Hematology before a joint meeting of the Sections on General Medicine and Public Health at the 77th Annual Session of the California Medical Association in San Francisco, April 11-14, 1948.

of Rh antibodies. These antibodies in turn diffuse back into the fetal blood, where they destroy the fetal red blood cells and tissues, causing the disease known as erythroblastosis fetalis, or hemolytic disease of the newborn.

These are the general facts concerning Rh, facts which concern primarily the obstetrician, the pediatrician and the clinical pathologist. There is one aspect of the subject, however, with which every practicing physician should be acquainted, in this day of increasing use of blood transfusions. I refer to the serious hazard of sensitization of the Rh-negative patient by transfusion.

It has been estimated that from 1 in 25 to 1 in 50[9, 11] Rh-negative women who give birth to Rh-positive infants become sensitized to the Rh factor. It was for some time considered that the remainder were incapable of producing Rh antibodies, and that the incidence of sensitization by transfusion was very similar to that by pregnancy.

Some relatively recent work, however, has demonstrated that the *majority* of Rh-negative persons develop Rh antibodies following repeated transfusions of Rh-positive blood. Diamond and his coworkers[1, 2] studied a group of several hundred Rh-negative service men who had received blood transfusions overseas, and found that over 50 per cent of them had demonstrable Rh antibodies in their sera. These observations have been corroborated in smaller series elsewhere.[4, 8] Diamond[1] likewise found Rh antibodies in the sera of a majority of unmarried Rh-negative women who had received blood transfusions; and among a small series of women who had experienced both transfusions and pregnancies, nearly all showed evidence of sensitization. More recently Diamond[5] and Wiener and Sonn-Gordon[12] succeeded in sensitizing a very large percentage of Rh-negative volunteers by repeated injections of Rh-positive blood.

That sensitization by transfusion may be responsible for severe hemolytic disease in infants born to such women has, of course, been well established. The following is a characteristic case:

CASE REPORT

A 25-year-old housewife was referred because of the death of her first two infants. The first was born at term and appeared normal, but rapidly developed intense jaundice and died on the second day. The second pregnancy, two years later, resulted in a stillborn hydropic fetus. Pathologic examinations on both infants revealed the characteristic picture of severe erythroblastosis fetalis.

Laboratory tests showed the patient's blood to be group A, Rh-negative, and the serum contained hyperimmune antibodies of Rh_0 specificity to a titer of 512. Her husband was Rh-positive, type Rh_1, Hr′-negative and Hr_0-negative (CDe/CDe). As these reactions indicated that he was homozygous Rh-positive, and that any children he might have would likewise be Rh-positive, it was necessary to advise this young couple that their chance for having children of their own was extremely poor.

Careful history revealed that as a girl, this patient had received a series of transfusions for anemia associated with nephritis.

Cases of this sort are unfortunately not particularly rare. Levine and Waller[6] have reported a series of 19, some of the patients having been sensitized by transfusion in early childhood. There is much evidence that Rh sensitization, once it is gained, is never lost. Even though the antibody may disappear from the blood, subsequent exposure to the Rh antigen elicits its prompt reappearance.

It is also rather common to encounter women who have had one or more perfectly normal children, but who then, following a transfusion, have delivered severely affected infants. It is becoming increasingly recognized that in order to prevent such tragedies, the Rh-negative female who has not passed childbearing age should never receive transfusions of Rh-positive blood—even in infancy.

On the other hand it is certainly less generally realized that even among male patients transfusion without preliminary Rh typing may be very dangerous. The picture of the acute transfusion reaction in its classic form is all too well known: The sudden chill with substernal or lumbar pain, the fall in blood pressure, often to shock levels, and the subsequent urinary suppression and uremia, often terminating fatally. Such reactions are fortunately rather rare, usually following transfusion with blood of incompatible major blood group. The fact that transfusion reactions due to Rh incompatibility are only rather rarely reported, and are usually among postpartum women, has been responsible for the common belief that Rh sensitization by transfusion is an unusual occurrence, and that it is only among the female population that routine Rh typing before transfusion should be practiced.

It has been pointed out by various workers,[3, 7] however, that hemolysis of transfused cells may occur without the characteristic signs and symptoms. It has been suggested that the lack of symptoms is due to the fact that the transfused cells are hemolyzed slowly in such cases, rather than immediately, as they presumably are when, for instance, group A blood is given to a group O patient. That asymptomatic hemolytic reactions do occur, but that even in such cases destruction of the hemolyzed blood may be very rapid, is illustrated by the following case:

CASE REPORT

A 48-year-old male Army officer received his first transfusion when injured in the Philippines. Six months later he was brought to a San Francisco hospital for surgical repair of his injuries, and while in the operating room he received 500 cc. of two-day-old whole bank blood drawn into acid citrate dextrose solution. Due to a clerical error in the laboratory, this patient had been recorded as Rh-positive, although he actually had not been Rh-typed at all. His blood was cross-matched with that of a group A Rh-positive donor, saline-suspended cells of patient and donor each being incubated with the serum of the other for 30 minutes at 37° C., and the tubes centrifuged. Since the cross-match showed no agglutination, the blood was considered compatible, and was sent to the operating room. The patient, who was conscious throughout the transfusion, did not complain of chill or discomfort, the blood pressure remained steady, and during the subsequent hours there was no elevation of temperature.

In the meantime the error had been discovered, and it was determined that the patient was actually Rh-negative. Another blood specimen was drawn immediately after his return from the operating room, and the Rh typing confirmed. In examining this specimen, however, two unexpected discoveries were made: (1) The patient's serum was brownish and appeared to contain not only an increase in bilirubin, but free hemoglobin as well; (2) although it had been less than two hours since he had received a pint of Rh-positive blood, *no Rh-positive cells could be found in the specimen.** It appeared that the transfused cells had been completely hemolyzed. The pre-transfusion blood specimen that had been taken from the patient then was tested for Rh antibodies, and was found to have hyperimmune antibodies of Rh_0 specificity to a titer of 64, and of Rh′ specificity to a titer of 8. There was no activity in saline.

During the ensuing 24 hours the patient passed brownish urine which gave a positive reaction to a chemical test for hemoglobin and which contained large amounts of urobilinogen. Although there was only the faintest discernible trace of icterus of the sclerae, the serum bilirubin rose to 3.0 mg. per 100 cc., the one-minute test being negative. Hemoglobinuria and bilirubinemia soon cleared, there was no suppression of urinary output, and during the three months that the patient was followed at this hospital, blood urea did not rise above normal levels. At the end of that time the only demonstrable effect of the transfusion reaction was his Rh-antibody titer which had risen to 4,000.

There are several lessons to be learned from this case, other than the obvious importance of keeping clerical errors out of the transfusion section: (1) The patient had been sensitized by a single transfusion six months before. Although sensitization is usually said to occur only after several transfusions, the author not infrequently has noted antibodies in the serum of patients who have received only one or two transfusions and who could not have been sensitized by pregnancy. (2) Although the patient's serum contained definite Rh antibodies, the routine tube cross-match with the Rh-positive bank blood did not reveal the incompatibility. This was due to the fact that the cross-match technique, although one widely used, was not designed to detect the *hyperimmune* or *blocking* type of Rh antibodies which usually occur in the blood of individuals sensitized by transfusions and which do not agglutinate saline-suspended cells. (3) Although the erythrocytes of an entire pint of blood apparently were hemolyzed within two hours, there were none of the symptoms usually associated with acute hemolytic reactions, and the only signs—the hemoglobinuria and icterus—were so minimal as to be missed entirely by the clinician until pointed out to him by a member of the transfusion section.

There is much reason to believe that asymptomatic transfusion reactions of this sort are not uncommon. Although the practice at Stanford University Hospital of routinely Rh-typing the blood of all patients who are to be given transfusion has obviated such reactions, the author has observed a few patients at other hospitals who hemolyzed one or more pints of blood with little or nothing in the way of symptoms. Likewise the author has seen a number of patients who had received as many as 30 or 40 transfusions elsewhere, whose serum contained a high titer of Rh antibodies, but who denied any symptoms of reaction. Surely many of them must have hemolyzed some of the transfused blood asymptomatically, just as did the patient in the case reported.

It is not surprising that such events should rarely be reported, since, in the absence of the characteristic chill, the average clinician does not feel it necessary to search for the less obvious signs of hemolysis. If such search were made, however, it probably would be discovered that, among Rh-negative patients who have received blood previously, apparently uneventful transfusions of Rh-positive blood are not infrequently followed by hemoglobinemia, hemoglobinuria, low-grade icterus and urobilinogenuria, and that such transfusions do not elevate the hemoglobin as they should.

In spite of their apparent innocuousness, such asymptomatic hemolytic reactions must not be dismissed as of no importance. In the first place, transfusions of incompatible blood are at best a waste of blood and of no help to the patient. On that basis alone they should be avoided. Secondly, it has yet to be determined that such reactions do not injure the patient. Only time and thorough study will determine whether there is permanent renal or hepatic damage in such patients. Finally, and most important, there is as yet no way of predicting which patients will hemolyze transfused blood without symptoms and which will die in shock or in renal failure. In view of these facts, it is the opinion of many, including the author, that transfusions of Rh-incompatible blood should be avoided, even in the male patient. The only way in which this can be done is to institute Rh-typing as a routine pre-transfusion procedure and to maintain a source of Rh-negative blood for the Rh-negative patients.

That this is not universally the practice, even with female patients, is due more to a lack of appreciation of its importance by the average physician than to any lack of facilities. Rh-typing techniques have been so simplified that they can be carried out reliably in the smallest laboratories and by the least trained personnel. Reliable Rh antisera are becoming increasingly available and the modern blood banks are prepared to supply Rh-negative blood on call. These facilities will not be properly utilized, however, or extended to smaller communities, where the big city blood bank is not available, until the medical profession becomes more fully aware of the potential for trouble in the Rh-incompatible blood transfusion.

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Head Retraction Reflex

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On BRISK stretching, every striated muscle reacts with brisk contraction. This reaction constitutes the deep muscle reflex. These reflexes are usually designated in textbooks by such terms as tendon, bone, periosteal, and osteoperiosteal reflexes. These names, however, are misleading, since the tendon, the periosteum, and the bone are simply places on which the blow of the reflex hammer is applied in order to evoke sudden stretching of the muscle. Such stimulation in itself does not initiate the reflex. In elicitation of the reflex, it is solely the stretching of the muscle fibers *en masse* that allows it to come into action. The term "deep muscle reflexes" is, therefore, appropriate. It follows, then, that it is not logical to designate each reflex according to the point of elicitation, since these points may be different and varied. It is far better to apply the names of the involved muscles—which when stretched respond and contract forthwith—than to associate the reflexes with the points of their elicitation, or to give them proper names. Monrad-Krohn in the eighth edition of his popular work, "The Clinical Examination of the Nervous System," uses the terms "glabella reflex (supraorbital periosteal reflex)" and "radialis periosteal reflex (supinator jerk)." How much simpler to say "orbicularis oculi reflex" and "brachioradial reflex"! Why use proper names as Hoffmann, Troemner, Bechterew, when the reflex named for them is, physiologically, a "finger flexor reflex"?

Some muscles react to stretching with contraction more easily than do others. Some are so located that it is difficult to stretch them briskly and effectively, or if they do contract, the contraction and the movement effected thereby is hardly discernible.

It is of paramount importance for the understanding of the deep muscle reflexes and for the evaluation of their manifestations to realize that in some muscles the threshold for contraction on stretching is so high, the visible manifestation of this contraction so delicate, that in normal it is hardly discernible on gross inspection and palpation. This is true, for instance, of the deep muscle reflex of the plantar muscles, the flexors of the toes. The so-called Rossolimo reflex is nothing else than this deep plantar muscle reflex; it is therefore not in itself pathologic, but is only a pathologic exaggeration of a normal but latent deep muscle reflex.

The same applies to the reflex of the muscles in the nape of the neck, which retract the head. This reflex cannot be elicited in normal persons but becomes manifest when the corresponding reflex arc is released from pyramidal control, as in cases of bilateral supracervical affection of the pyramidal tract. To elicit a stretch reflex of these muscles, the patient must keep his neck muscles loose and his head slightly bent forward. The examiner applies a blow downward to the middle of the upper lip in order to effect a brisk bending of the head. When this reflex is positive, the patient answers with a quick retraction of his head. The deep muscles in the nape of the neck, the head retractors, react to sudden stretching in the same way as any other muscles. This is the head retractors' reflex, or, for the sake of euphony, head retraction reflex. This reflex has been found positive in the presence of lesions of the pyramidal tracts above the cervical cords—in diffuse brain lesions, as cerebral arteriosclerosis, hypertensive encephalopathy, cerebral lues. It is further positive in the presence of all spinal lesions which have a tendency to creep upward and to affect the pyramidal tracts of the cerebral hemispheres, for instance in amyotrophic lateral sclerosis, lateral sclerosis, dorsolateral sclerosis. This reflex may thus indicate whether a spinal lesion has transgressed the boundaries of the spinal cord and has affected the pyramidal tracts above the cervical cord.

Physiologically the head retraction reflex belongs to the syndrome of decerebrate rigidity in which the retraction of the head may be very pronounced. It is an expression of the mildest, subclinical form of such decerebrate rigidity.

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Heart Disease as a Complication of Pregnancy

With Emphasis on Indications for Recommending Therapeutic Abortion or Avoidance of Conception

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SUMMARY

Mere diagnosis of a valvular heart lesion without circulatory incapacity is inconsequential in considering the prognosis for a pregnant woman.

There are grave dangers of heart failure during pregnancy, labor or the postpartum period in women who have had congestive failure prior to pregnancy or during a previous pregnancy and delivery.

Decisions as to whether or not to recommend avoidance of pregnancy or therapeutic abortion should depend not alone upon the prospect of death during gestation or at the time of delivery, but also upon the possibility of increased impairment of heart function and physical incapacity of the mother in the postpartum period.

Because of the extensive surgical procedure there are few indications for interrupting pregnancy after the third lunar month; and because the major circulatory loads do not increase after the eighth month, rarely should labor be prematurely induced after that time.

The exertion of labor, although generally inconsequential, in some cases may produce sustained oxygen debt. In cases in which labor in a previous pregnancy has been accompanied by heart failure, cesarean section should be considered as a means of lessening the possibility of serious failure or death, although this is not a frequent consideration.

In the resemblance of circulatory changes that occur, during delivery and immediately postpartum, to those changes produced by the closure of an arteriovenous shunt or patent ductus arteriosus, lies a suggestion as to some of the causative factors in heart failure during or soon after delivery. Probably of great importance is the decrease in blood volume and hemoconcentration at delivery followed by the return of water to the circulatory system, with consequent transient increase in blood volume, in the postpartum period. Additionally, the rise of venous pressure after use of oxytocic drugs suggests that rapid infusion of blood from an engorged uterus may cause an abrupt and perhaps poorly tolerated hypervolemia.

Death by heart failure in pregnancy and the puerperium has become extremely rare in recent years due to the frequent observations, meticulous diagnosis of impending failure and improved care of cardiac patients jointly by the obstetrician and the internist. In addition to digitalis therapy and sodium restriction, patients exhibiting evidence of impending heart failure may require bed rest through the entire third trimester of pregnancy. Oxygen should be administered during labor in such patients and anoxia guarded against during anesthesia.

ALTHOUGH it has been reported that about 2.5 per cent of all women of childbearing age have heart disease, much of this proportion is made up of those who have mere anatomical cardiac defects which do not materially affect circulatory efficiency during pregnancy and delivery. Yet there remains a considerable number of women in this age field who have serious cardiac incapacities which might lead to grave heart failure or death under the additional stress of pregnancy and parturition, or to increased incapacity afterward.

One of the purposes of this presentation is to consider the circumstances in which prevention or termination of pregnancy might be recommended with regard not only to the immediate hazard of death during gestation or delivery but also to the long-term effect on cardiac efficiency.

Until the current decade, obstetricians struggled in a welter of conflicting criteria for determining the degree of hazard of heart disease. Some believed aortic insufficiency to be the gravest lesion, others, including Lusk,[19] that mitral stenosis was so serious as to warrant termination of pregnancy. Through the time of Jensen's[16] publication in 1938 and Hamilton and Thomson's[14] in 1941, auricular fibrillation was considered to be associated with heart failure and fatality in about one-third of the cases. Mackenzie[20] stated in 1904 that a normal heart shows

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derangement of function in pregnancy. All recognize that occasionally abrupt and critical failure with pulmonary edema occurs unexpectedly in certain previously well women late in pregnancy, during labor, or in the first 24 hours postpartum.

Within the past ten years, however, with information regarding larger series of individual studies of patients and with a better understanding of the circulatory loads in pregnancy, labor and the postpartum period, improved criteria have developed for use in deciding the advisability of proscribing conception or recommending early therapeutic abortion (within the first eight weeks) for women with heart disease.

The considerations upon which these criteria have been based are:

1. *Maternal mortality*,* which now approaches the vanishing point, possibly due to the application of the criteria outlined in the following paragraphs, as well as to the improved diagnosis and care of patients in cardiac-obstetrical clinics.

2. *Fetal mortality*—stillbirths and neonatal deaths. At New York University division of Bellevue Hospital[5] the fetal deaths at term were 9 per cent in mothers having cardiac disease without heart failure and 30 per cent in those with heart failure, as contrasted with 7 per cent in mothers without heart disease. There were no fetal deaths at term in the series at the University of California Hospital.

3. *Development of heart failure* with possibility of death—this to be considered not only as regards the immediate risk, but also as probably producing diminished circulatory efficiency in the future life of the mother.

4. *Effect on life expectancy.* Boyer and Nadas[1] found no difference in duration of life as between parous and nulliparous women who died of congestive heart failure. It is possible that such a statistical analysis is entirely correct, but it seems probable that this series of cases may not reflect occasional unfavorable effects of pregnancy upon women with heart disease.

5. *Impairment of circulatory efficiency.* As this has been found to be not unusual in patients with heart disease who have been subjected to physical effort of unusual degree or duration, it is logical to assume that the added physical loads of pregnancy and labor in certain instances may be of such degree as to have a similar deleterious effect. (This aspect will be discussed more fully in later paragraphs.)

From these basic considerations the following criteria have been evolved:

1. The mere anatomic existence of a particular valve lesion is not of prognostic importance: current or impending functional impairment alone is important.

2. *Both congenital and rheumatic lesions* are well or poorly tolerated in accordance with the mechanical handicap produced. Williams[28] and others have described a postpartal heart disease in which right and left heart failure occurs two to six weeks postpartum, with spontaneous recovery three to six weeks after onset. The cause of this phenomenon is unknown, but renal disease and hypertension are frequent concomitant findings.

3. *Auricular fibrillation* (as well as other arrhythmias, including complete A-V block) is not in itself a grave complication. Mendelson[23] of Cornell University Medical School reported no deaths in seven cases. However, because it is indicative of advanced cardiac disease, the greater likelihood of circulatory incompetence is a factor for consideration in such circumstances.

4. *Rheumatic activity* was reported by both Laubry and Routier[17] in France and Chavez[7] in Mexico as a grave and not uncommon complication. Hamilton and Thomson[14] fear recurrence when rheumatic fever has been active within six months of pregnancy. In women under 23 years of age, the chance of recurrence is 10 per cent greater than in older patients, as would be expected from Cohn and Lingg's[11] report that after seven years from onset, recurrence is unlikely. (The mean age at which the first attack occurs is 17 years.) Recurrence of rheumatic fever causes little concern in San Francisco: at University of California Hospital only five recurrences were observed among 90 pregnant women with rheumatic heart disease, and these were without influence on the courses of the patients during and after pregnancy.

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*Unfortunately, reports of mortality rates offer the only standard for gauging from statistics originating in many quarters the deleterious effect of pregnancy and labor on women with heart disease. Lesser effects than death are not uniformly reported. By this one standard, however, considerable improvement has been recorded: There have been many reports of reduced mortality rates during pregnancy and labor among women with heart disease where cardiac-obstetrical clinics have been established. From 9.38 per cent prior to 1922, the rate fell to 3.24 per cent for the period 1936-46, according to a compilation by Bunim and Rubicus[5] of 23 reports covering an aggregate of 4,869 delivery cases. Even this rate is materially higher than that noted in reports from 1944 to 1947: Mendelson[23] stated that there were no deaths in 200 deliveries of patients with rheumatic heart disease, and Bunim and Rubicus[5] reported a mortality rate of 1.4 per cent, while Lund[18] reported one death in 29 deliveries of patients with congenital heart disease. In the 12 years 1936-48 there has been neither a maternal nor a term fetal death in the University of California Hospital in 119 patients with cardiac disease who were delivered there and who had been followed prior to delivery in the obstetrical-cardiac clinic. Although Hamilton and Thomson[14] stated in 1941 that there was an irreducible minimum death rate of 2.5 per cent due to subacute endocarditis, embolism, sepsis and hemorrhage, the use of antibiotics and anticoagulants has now reduced this "irreducible minimum."

The lower rate of deaths from heart failure where obstetrical-cardiac clinics have been established with trained internists or cardiologists in attendance is probably ascribable to (1) the more exact attention to the patients, (2) the greater diagnostic acumen of the internists in discerning the lesions and the early signs of heart failure, (3) the more expert use of drugs and physical management of heart failure, and (4) the gradual development, through experience, of the criteria for (a) permitting pregnancy, (b) abortion, (3) hysterotomy and (d) selecting the type of delivery—pelvic or cesarean—and the means of anesthetization.

5. *Age.* Hamilton found the incidence of heart failure in pregnant patients over 35 years of age to be double that in younger pregnant women. As is shown in Table 1, the incidence of lowered circulatory efficiency after delivery was thrice as great among women over the age of 35 as in younger women. Tendency toward heart failure in the older age groups has been attributed by Bunim and Rubicus[5] solely to the longer duration of the heart disease.

6. *Parity.* There is general conflict of opinion as to whether the likelihood of heart failure is greater in primiparous or in multiparous women with heart disease. Primiparas generally undergo greater physical and circulatory strain during labor, which could precipitate heart failure. Multiparas, on the other hand, grow older with each pregnancy and additionally often have more difficult labor after the fourth confinement. Eastman[12] reported a rise in mortality rate from 0.37 per cent in para 2 to 8 women to 1.15 per cent in those over para 8. Among para 8 women, one in five has hypertension or chronic nephritis. Longer duration of heart disease in women in the higher parity groups may explain other instances of congestive failure.

7. *Duration of heart disease* (rheumatic). The figures of Bunim and Rubicus show a rise in heart failure in pregnant women from 4 per cent in the first ten years after onset of rheumatic heart disease to 13 per cent between 10 and 14 years, to 18 per cent between 15 and 19 years and to 23 per cent 20 years and more after onset. (The progressive rise in incidence of failure coincides roughly with the increasing incidence of failure with advancing age.) This is an important criterion in considering the possibility of fatal outcome during or following pregnancy, since Cohn and Lingg[11] showed that the mean duration of life in all patients with rheumatic heart disease after onset of failure was three years. Using a more accurate statistical method, Wilson and Lubschez[4] present a more optimistic estimate of duration of life in patients with rheumatic heart disease.

Another factor for consideration in this regard is the relationship of the age of the patient to the severity of the heart disease. Hamilton[13] observed that whereas among women with heart disease of functional Classes I and II (favorable) the death rate between the ages of 20 and 40 years is the same for those who are pregnant as for those who are not; in Classes III and IV the annual death rate is 18 per cent for pregnant women against 6.7 per cent for the non-pregnant.

8. *Degree of failure before pregnancy* has long been recognized as a prognostic criterion. Among patients in Class III and IV, as found by Hamilton and Thomson[14] in their "unfavorable" group, the mortality rate from heart failure was 12 per cent, as contrasted with 0.5 per cent among patients in Classes I and II. Bunim and Rubicus reported that only one patient in a series of 82 in Classes I and II had serious failure in pregnancy, as contrasted with about one-third of the patients in Classes III and IV.

A high degree of failure, therefore, would seem to be the chief contraindication to pregnancy. However, as the statistics show a surprisingly high percentage of women in Classes III and IV who do not develop serious complications, the criterion is not absolute and there is margin for consideration of other factors in deciding upon advice and procedure. Even though the risk is appreciable, if the patient wishes to take it for personal reasons or because of religious beliefs, the percentages still favor successful outcome.

9. *Heart failure in a previous pregnancy*—unless transient and precipitated by some complication such as pneumonia, pulmonary embolism, active rheumatic carditis, paroxysmal auricular fibrillation or tachycardia or toxemia — is strong reason to expect recurrence of failure in a succeeding pregnancy (nine out of nine was the experience of Bunim and Rubicus). It is conceivable that, with greater rest, digitalis therapy and salt restriction, failure can be prevented, but this is certainly one of the strongest indications for preventing or interrupting pregnancy unless the risk is explained to and accepted by the patient.

10. *The influence of hypertension* on the outcome of pregnancy has not yet been ascertained, but this disease probably does not produce a serious complication. Sharkey and Hess[25] reported that there were neither fetal nor maternal deaths in a series of 118 pregnant women with essential vascular hypertension. Chesley, Annito and Jarvis,[8] from observation of 301 pregnancies in 218 women with hypertension, concluded that the condition was hazardous only insofar as it affected the chances of occurrence of toxemia. However, the incidence of toxemia in hypertensive patients was seven times the normal rate of occurrence, with maternal mortality 20 times normal and fetal mortality ten times normal. Apparently, then, previous history of toxemia in association with hypertension would be a relative contraindication to pregnancy.

DECREASED CIRCULATORY EFFICIENCY

As to the previously mentioned question of increased impairment of circulatory efficiency by reason of pregnancy, an additional consideration is the future well-being of the patient and the effect upon her household. If pregnancy and parturition are likely to result in greatly diminished capacity of a woman to take care of her children and household, leading to a social and economic problem, this is an added contraindication to the continuance of pregnancy when such dangers are predictable by the criteria outlined. To assume that maternal death or complete recovery are the only extreme consequences of pregnancy and labor in women with heart disease, and that no intermediate results of increased crippling should be considered, seems illogical, although it is a widely accepted attitude.

Present data from the University of California obstetrical-cardiac clinic (Table 1) show that approximately 12 per cent of the patients under 25 years of age and 33 per cent of patients above that

TABLE 1.—*Influence of Pregnancy on Postpartum Circulatory Efficiency, Relative to Age, Parity, Mode of Delivery (107 Patients).*

Parity	Mode of Delivery	No. of Patients	Dim. Postpartum Funct.	Percentage
	UNDER AGE 35			
Grav. I	Pelvic	35	5	14.3
	Cesarean	3	0	......
	Abort. or Hyst.	1	0	......
Total		39	5	13.0
Grav. II-IV	Pelvic	37	5	13.5
	Cesarean	4	0	......
	Abort. or Hyst.	2	0	......
Total		43	5	11.6
Grav. V-IX	Pelvic	11	1	9.1
	Cesarean	1	0	......
	Abort. or Hyst.	1	0	......
Total		13	1	7.6
TOTALS	PELVIC	83	11	13.2
	CESAREAN	8	0	......
	ABORT. OR HYST.	4	0	......
		95	11	11.6
	OVER AGE 35			
Grav. I	Pelvic	0	0	......
	Cesarean	0	0	......
	Abort. or Hyst.	0	0	......
Total		0	0	......
Grav. II-IV	Pelvic	6	1	16.6
	Cesarean	1	0	......
	Abort. or Hyst.	0	0	......
Total		7	1	14.3
Grav. V-IX	Pelvic	5	3	60.0
	Cesarean	0	0	......
	Abort. or Hyst.	0	0	......
Total		5	3	60.0
TOTALS	PELVIC	11	4	36.4
	CESAREAN	1	0	......
	ABORT. OR HYST.	0	0	......
		12	4	33.3
	COMBINED TOTALS			
Grav. I	Pelvic	35	5	14.3
	Cesarean	3	0	......
	Abort. or Hyst.	1	0	......
Total		39	5	12.8
Grav. II-IV	Pelvic	43	6	14.0
	Cesarean	5	0	......
	Abort. or Hyst.	2	0	......
Total		50	6	12.0
Grav. V-IX	Pelvic	16	4	25.0
	Cesarean	1	0	......
	Abort. or Hyst.	1	0	......
Total		18	4	22.0
TOTALS	PELVIC	94	15	16.0
	CESAREAN	9	0	......
	ABORT. OR HYST.	4	0	......
		107	15	14.0

Of those showing postpartum diminished cardiac function, 6 out of 15 were Class III or IV.

Of those not showing postpartum diminished cardiac function, 11 out of 92 were Class III.

age have diminished ability to undertake physical work after delivery. That multiparity may have some further effect in this connection is indicated by the fact that three out of five patients over the age of 35 who were para 5 to 9 experienced a reduction in physical capacity. No attempt was made in these cases to demonstrate frank failure by measurement of venous pressure or circulation rate, inasmuch as most of the patients did not show objective signs of heart failure and only 20 per cent had functional impairment of an order greater than Class II. It is recognized, therefore, that psychic factors rather than true dynamic circulatory insufficiency may have caused some of the diminished physical capacity in these patients. In this regard it is noteworthy that approximately two-thirds (11 out of 17) patients with Class III and IV impairment were apparently as physically capable after pregnancy as before. However, that reduction in circulatory efficiency occasionally does occur even in Class I and II patients should be evident to all clinicians making follow-up postpartum observations of patients with heart disease.

A case report will serve to illustrate this point as well as the application of the criteria for determining whether to terminate pregnancy in an early stage or permit it to continue.

CASE REPORT

The patient, aged 24, when examined at the obstetrical-cardiac clinic in the ninth week of pregnancy gave a history of acute rheumatic fever at the age of 11 years which involved the extremities, jaws and spine. Attacks lasting a few days recurred about every six months. The last attack had been three months previously, when the patient spent a week in bed, with fever and with pain and swelling in the knees, ankles and elbows.

It was not until the patient was 19 years of age that a valvular defect had been diagnosed, but dyspnea had been present on running or climbing since the original attack of rheumatic fever. During a first pregnancy, a year and a half before the present one, the patient had felt well until dyspnea and orthopnea recurred in the sixth month. Digitalis was given during the remainder of that pregnancy and the patient felt improved in the ninth month although limited to chair and bed.

After delivery, the patient stopped taking digitalis and she then noticed more dyspnea than in the last months of pregnancy, especially when climbing stairs. She felt that the dyspnea was definitely worse then than it had been prior to pregnancy.

Upon physical examination the blood pressure was 124 mm. of mercury systolic and 74 mm. diastolic, and the pulse rate was 75 at rest, 112 following exercise. There was no edema and no rales were noted. The chest was slightly funnel-shaped. A roentgenogram revealed the heart to be moderately enlarged, but an electrocardiogram tracing showed no abnormality. Vital capacity was 1,600 cc. Erythrocyte and leukocyte counts and the blood sedimentation rate were within normal limits. There were characteristic signs of mitral stenosis and insufficiency and aortic insufficiency.

In this case the results of applying the previously outlined criteria were as follows:

Indications for termination of pregnancy:

1. Definitely increased dyspnea during sixth to ninth month of previous pregnancy. Functional Class III in second month of current pregnancy.
2. Recurrence of rheumatic fever within six months of current pregnancy.
3. Dyspnea worse after pregnancy than prior to or even during eighth or ninth month of pregnancy (when activity was limited).
4. Questionable ability to care for two children.
5. Thirteen years since onset of rheumatic heart disease.
6. Danger of serious heart failure with any intercurrent complications, such as respiratory tract infection.

Reasons for continuation of pregnancy:

1. Strong desire for second child.
2. Assurance of household care during pregnancy and of assistance afterward.
3. Available hospital and medical care during pregnancy.
4. Multiparity, with previous delivery by low forceps after two hours of "easy" second stage labor.
5. No current rheumatic fever.
6. Religious belief relative to abortion.
7. Current conservative attitude of obstetrical hospital staff.

The pregnancy was not terminated and heart failure did not develop. Indeed, after delivery the patient showed less evidence of insufficiency than when first observed early in pregnancy, possibly because of enforced rest in the last trimester.

CRITERIA FOR LATER TERMINATION OF PREGNANCY

The criteria for interruption of pregnancy after two and a half months are still more unsettled than those for prevention or early abortion. In years past, hysterotomy was not uncommonly done between the sixth and ninth month of pregnancy in the presence of persistent heart failure. Hamilton[14] reported hysterotomies in 7.5 per cent of such cases up to 1941, but has recommended the operation rarely since 1944. No hysterotomies were performed by the New York University group,[5] and whereas four were done at the University of California Hospital in the first five years of the obstetrical-cardiac clinic, there have been none in the past seven years.

Other than the development of means for meticulous care of patients with heart failure by bed rest and the administration of digitalis and diuretics, the chief reason for this change of attitude has been an appreciation of the nature and timing of the circulating loads of pregnancy.

An increase in load begins to appear about the fifth lunar month, and according to Cohen and Thomson[10] (Figure 1) and Burwell[6] there is continued increase until midway of the ninth lunar month, when the load diminishes about 10 per cent from the peak. (This late decrease is not confirmed by McLennon and Thoun.[21])

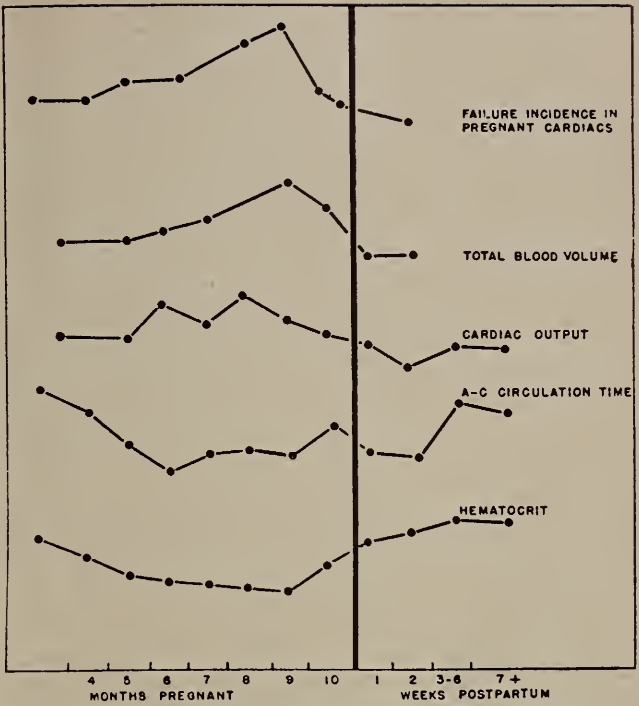

Figure 1.—Circulatory burden on the heart in pregnancy (from Cohen and Thomson, J.A.M.A., 1939, 112:116).

Explanation of the rising loads lies in:

1. Increase of total blood volume by an average of 32 per cent (McLennon and Thoun[21]) and a maximum of 45 per cent. As the plasma volume increases to a greater extent than the cell mass, in a ratio of about 2:1, a false appearance of anemia results because of the relatively smaller content of packed red cells in the increased volume of whole blood.
2. Increase in cardiac output to a maximum of 50 per cent.
3. Increase in basal metabolic rate to, generally, a maximum of 12 per cent.
4. Increase of body weight from three sources, totaling an average of 6.67 kg.: (a) The products of conception, rarely over 5 kg. (1,500-2,000 cc. of water in fetus, placenta and amniotic fluid)[9]; (b) gain in maternal fat tissue, an unnecessary load controllable by diet; (c) water gain (maternal) averaging 2.5 kg. or about 2,500 cc. About one-fifth of all obstetrical patients show abnormal water gain, and in them there is a tendency toward preeclamptic states and edema. About 60 per cent of this maternal water is lost in the first six days postpartum.

Cohen and Thomson[10] have observed that the incidence of heart failure increases through the eighth lunar month of pregnancy and then diminishes to term. This has not been confirmed by Mendelson[23] or Bunim and Rubicus[5] who found the onset of failure equally distributed from the fifth to the tenth lunar month. It is important to recognize evidence of impending heart failure if proper treatment is to be instituted. Certain changes have been found to occur in the circulatory system during pregnancy in normal women, and deviations from these normal changes should alert the physician to the possibility of heart failure. These normal changes are:

1. Increase in vital capacity by about 10 to 15 per cent maximal to term. The measurement of vital capacity is a very important routine clinical test.
2. Venous pressure[22] in the upper extremities increases only 1 to 2 cm. of water after the 25th week of pregnancy. In the lower extremities it increases in the last 30 weeks of pregnancy.
3. Circulation time generally diminishes from the 20th to the 30th week.
4. Blood pressure. Normally there is elevated pulse pressure through the last four months of pregnancy. Commonly there is a slight fall in systolic and diastolic pressure in the middle trimester, with recovery in the last trimester—not to be considered evidence of impending toxemia.
5. Diminished arteriovenous oxygen difference. This is not commonly measured clinically.
6. Increased blood volume with hemodilution as evidenced by hematocrit measurement.

Why these changes in the blood volume, in the metabolic rate and in the arteriovenous oxygen difference occur is not entirely explained.

The theory of Burwell[6] that the placenta acts as an arteriovenous shunt may well be the answer to most of these changes. Probably the variation in estrogenic hormone content causes a negative sodium balance. Thorn and Emerson[27] showed sodium and water retention in cycles at the premenstrual period in hysterectomized patients as well as in normal women, and with estrogen therapy in castrated women. Taylor, Warner and Welsh[26] reported preventing postpartum diuresis with estrogen administration. The similar action of desoxycorticosterone acetate is well known and, hypothetically, the pituitary antidiuretic hormone may play a role in water retention and possibly in hypervolemia.

Additionally it is known that there is increase in the volume of the peripheral vascular bed in patients with abnormally high metabolic rates, as in hyperthyroidism. This increase in the peripheral vascular bed is also associated with a gain in blood volume and as such may be a partial explanation of the hypervolemia of pregnancy.

TYPE OF DELIVERY

The determination of type of delivery in the presence of heart disease has been a subject of much discussion. Data reported by Hoffman and Jeffers[15] indicate that, among patients with rheumatic heart disease, deaths in the first two postpartum days occur as commonly following delivery by cesarean section as by the pelvic route. Reports by Hamilton[13] and Mendelson[23] indicate a mortality rate of 12 per cent after cesarean section as against no deaths after pelvic deliveries in Class III and IV patients. Bunim and Rubicus have expressed the opinion that heart disease is never an indication for cesarean section. That these statistics ought to be weighed in considering the interruption of pregnancy or cesarean section in critical cases is evident, but no doubt exists that important circulatory changes occur during delivery and the postpartum period irrespective of the type of delivery.

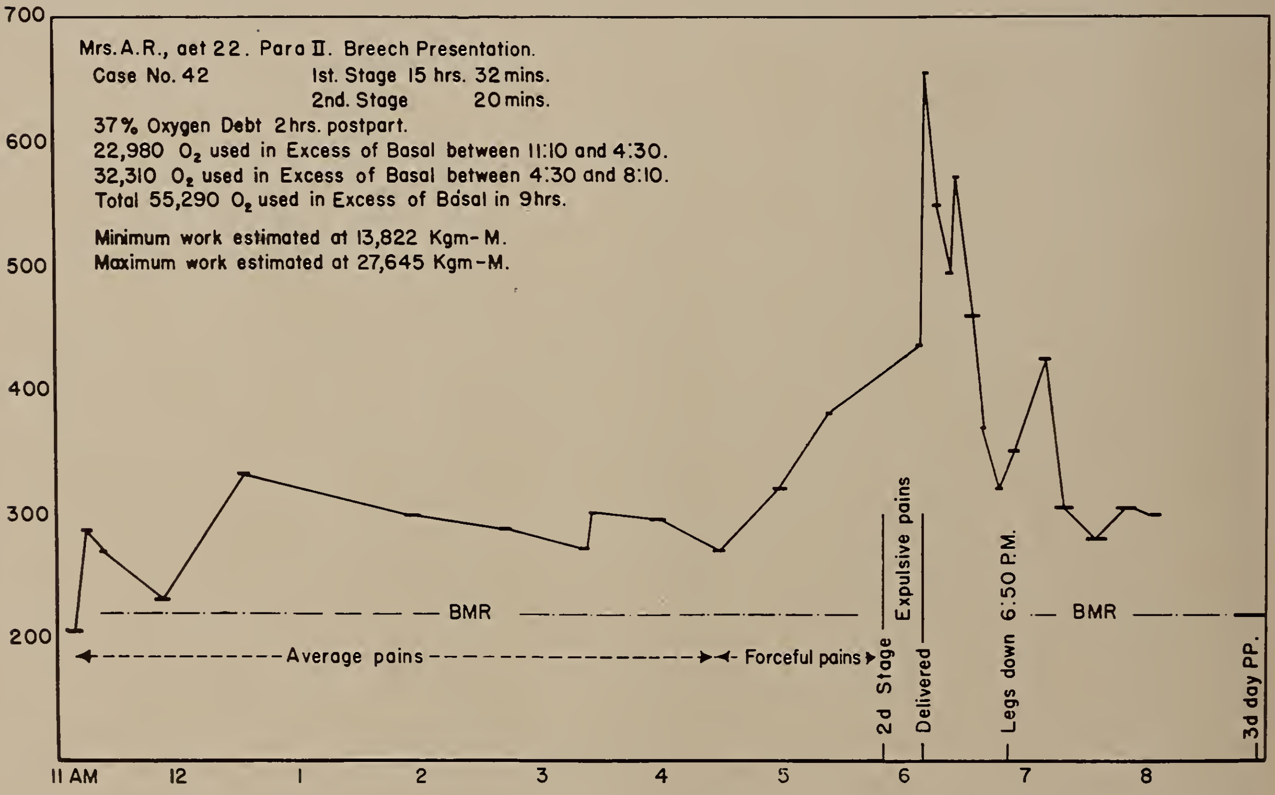

Figure 2.—Rate of oxygen consumption during and following labor as evidence of physical work of labor (Sampson et al.[24]).

To evaluate the mechanical effect of labor in producing circulatory strain, Sampson, Rose and Quinn[24] estimated the physical work of labor and the residual "oxygen debt" in 40 women by periodic determinations of oxygen intake during and following labor. The conclusions of this study were (1) that the work may be negligible, but (2) that even in multiparous women, if a complication develops, there may be abrupt and considerable loads of work undertaken, equal to climbing a 30-story building in about one hour (Figure 2); (3) that "oxygen debt" persisted for more than an hour in patients with heart failure and also in normal women, chiefly primiparous who apparently had performed heavy work: (4) that work of this degree would be proscribed for non-pregnant patients of Class III and IV on the grounds of experience that failure may be precipitated by heavy work; (5) that cesarean section is well tolerated on the operating table and that the dangers surgically and from postpartum heart failure must be weighed against the benefits of relief from expenditure of an indeterminate amount of physical energy in labor. Occasionally a history of previous precipitation of heart failure by labor would indicate cesarean section to avoid failure in a subsequent pregnancy.

Circulatory changes other than those caused by oxygen uptake and transport have been measured by Brown, Sampson, Wheeler and Giansiracusa[2] during and immediately following labor. Included were measurement of blood volume, packed cell volume, venous pressure, circulation rate, pulse rate and blood pressure (Figure 3). The conclusions from this study were:

1. That, except in frank heart failure, rise in venous pressure occurred only following use of oxytocic drugs. This may be explained by the sudden infusion of semi-pooled blood from an engorged uterus into the systemic circulation. Abrupt delivery of blood from the uterus, as at cesarean section, may be less well tolerated than the slower emptying by the repeated uterine contraction of labor.

2. That changes in pulse rate and blood pressure immediately after delivery suggest in a significant percentage of cases the same process as that which occurs with the obliteration of an arteriovenous shunt.

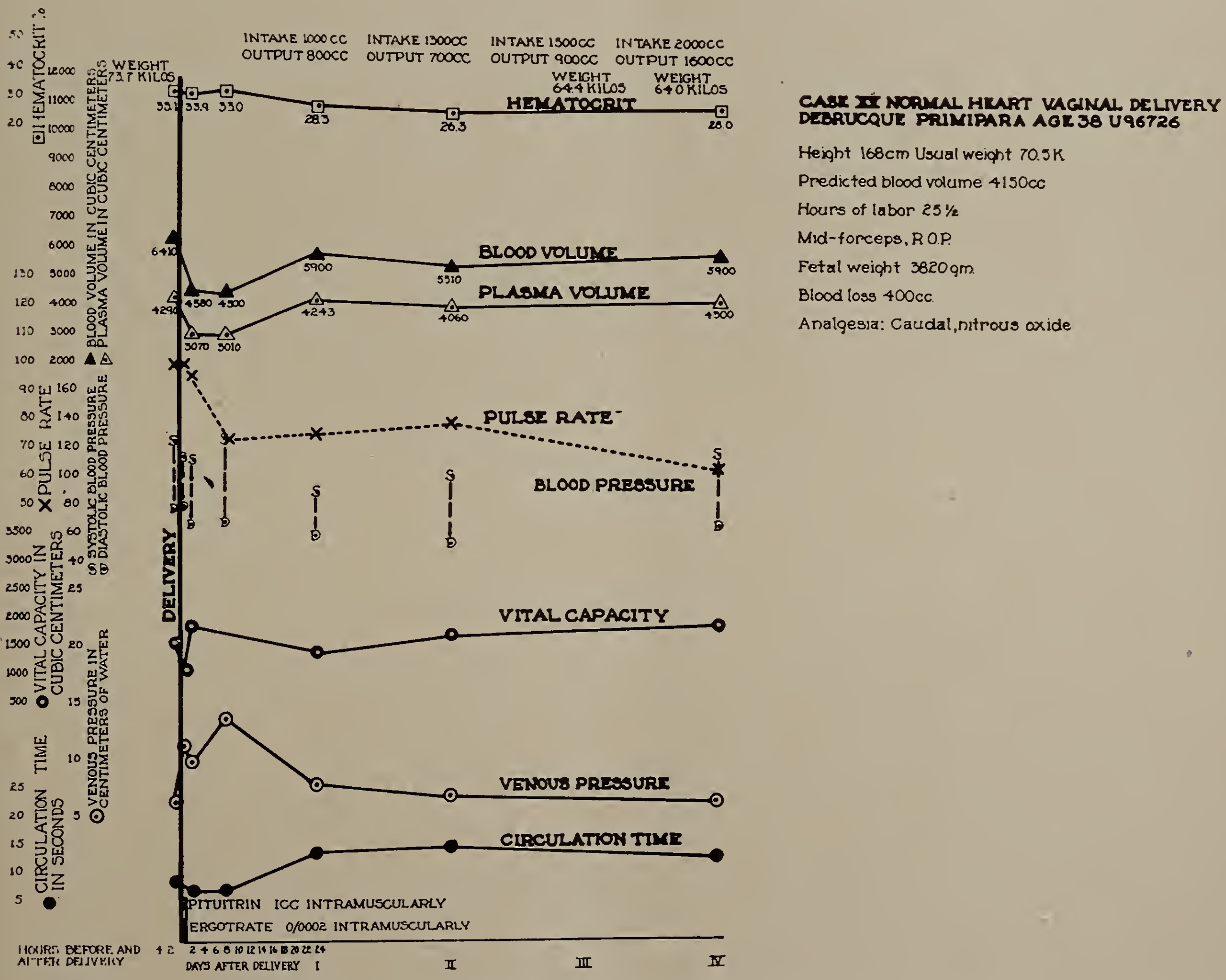

Figure 3.—Measurement of certain circulatory functions in a normal patient immediately prior to and following normal delivery (Brown et al.[2]).

3. That a fall of blood volume and hemoconcentration occurs after delivery but that there is a partial reversal of this decline before normal stabilization in three to five days. Such a process also occurs after ligation of patent ductus arteriosus, according to Brown,[3] and in some such cases heart failure seems to accompany the return of the blood volume. This is one of the first clues, although still to be confirmed, as to a possible cause of postpartum cardiac failure or death.

Finally, studies made by Brown, Hopper, Mudrick and Sampson[4] showed that repeated periods of Valsalva's maneuver (forced expiration with closed glottis) with elevated venous pressures can cause significant filtration of water out of the blood stream. As the Valsalva effort duplicates in some degree the mechanics of labor, the studies may indicate why hemoconcentration follows delivery.

THERAPY

During pregnancy, bed rest, digitalis, diuretics and restriction of sodium intake may be used in combatting heart failure, quinidine in prevention or correction of arrhythmias, and antibiotics in treatment of infections and recurrence of rheumatic fever. Oxygen inhalation may be necessary at times; it is particularly important during labor. Great care should be taken to avoid anoxia during anesthesia. For this reason the use of nitrous oxide and oxygen to obtain deep anesthesia is considered inadvisable since anoxia almost invariably accompanies such anesthesia.

Suggestions for therapy to be applied to patients with heart failure during the immediate postpartum period are (1) restriction of oxytocic drugs as much as possible because of their precipitation of an abrupt rise in venous pressure, (2) mercurial diuresis, (3) possibly withdrawal of blood, unless anemia is present, and (4) a longer period of postpartum bed rest than is given to the normal patient.

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Surgical Treatment of Patent Ductus Arteriosus

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SUMMARY

Since it would appear that diagnosis of patent ductus arteriosus can be made accurately in a high percentage of cases, and as the surgical treatment of this lesion is highly successful with a low mortality and morbidity rate, operation is advisable for all patients with this lesion except those who are 35 years of age or older and who have no progressive cardiac hypertrophy and no incapacitation due to the fistula. The optimum age for operation is three years. The vast majority of the patients have a ductus that can be divided, and division has advantages over ligation.

In cases in which patent ductus arteriosus is complicated by subacute bacterial endocarditis, operation should be done following intensive penicillin therapy.

TEN years ago Gross[1] first successfully ligated a patent ductus arteriosus and since then physicians have shown a greater interest in the accurate diagnosis of congenital cardiac lesions and surgeons have met the challenge, either to alleviate or to cure these malformations. Great advances have been made in the production of fistula shunts in patients having pulmonary artery stenosis and in the resection of coarctations with end-to-end anastomosis of the aorta. More recently Smithy resected the scar of a mitral stenosis with a valvulotome introduced through the ventricle, and the result was great clinical improvement of the patient. Experimental surgery gives promise of successful closure of interauricular septal defects, although the author knows of no case in which it has been attempted in a human. These newer and more recent spectacular operations have overshadowed the surgical ligation and division of the patent ductus arteriosus which have now become commonplace surgical procedures that no longer create the comment or the attraction that they invited so recently as three years ago.

SYMPTOMS AND PHYSICAL FINDINGS

In patent ductus arteriosus there may be no symptoms whatsoever, and the patient may appear well and normal. Palpitation, weakness, ease of fatigue and inability to keep up with the activities of other children are not uncommon. Tachycardia, fainting attacks, dyspnea on exertion and epistaxis are occasionally complained of, and, finally, the usual symptoms of cardiac failure and of subacute bacterial endocarditis may be noted in the more acutely ill patients with complications.

Although most of the patients are slim and underdeveloped, some appear normally developed in all respects. Retarded physical growth and development are attributed by Eppinger and Burwell[1] to the shunt of blood from the aorta to the pulmonary artery with a diminution of the peripheral flow. These patients have no clubbing of the digits or cyanosis unless there exists another congenital lesion for which the patent ductus arteriosus may be an accommodating fistula or unless the patient is in heart failure.

An active precordial heave and visible pulsation of the cervical vessels may or may not be noted, but a palpable thrill is felt over the pulmonic area in the vast majority of patients. The thrill may be systolic or continuous with systolic accentuation and may not appear until the third or fourth year of life. In some of the patients observed by the author, detection of the thrill by the mother led to the patient's being examined and the diagnosis is made. If the thrill is absent in a patient over four years of age who has patent ductus arteriosus one might speculate that the ductus is small.

The murmur may be absent or easily missed in infants because of the rapidity of the heart and the small size of the chest, but usually after the third year the murmur is definitely a characteristic one: it is a continuous rumbling "machinery murmur," usually accentuated during systole or early diastole, maximum in intensity in the pulmonic region, and transmitted over the precordium to the back and to the axilla. In all cases in which a continuous murmur was questioned clinically, an electrical sound recording of the murmur proved it to be continuous. The second pulmonic sound was increased or reduplicated in almost all cases observed by the author.

The vast majority of patients observed had elevated pulse pressure with low diastolic blood pressure, and the latter usually was difficult to measure accurately, there being no sharp point which could be read with certainty. Exercise, exertion and excitement caused pronounced increase in the pulse pressure and lowering of the diastolic pressure in most patients. Corrigan pulse and pistol-shot sounds over the femoral arteries may be observed in patients with a large ductus. Blood pressure readings are taken in both upper and lower extremities to detect coarctation of the aorta.

Usually, although not in all cases, the heart is

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slightly enlarged. Ordinarily the heart rate is increased and the intensity and vigor of the heart action is greater than normal; exercise definitely increases the rate and the intensity of the heart beat more than would be expected in a normal patient.

LABORATORY FINDINGS

Electrocardiographic studies usually show no abnormality and no axis deviation because the left ventricle pumps a larger volume per minute and the right ventricle must pump against an elevated pressure in the pulmonary arteries, the additional loads more or less counterbalancing one another. Axis deviation should arouse suspicion of the presence of another lesion, and a right axis deviation would particularly suggest pulmonary stenosis.

Fluoroscopic and roentgen studies usually demonstrate some cardiac enlargement, prominence of the pulmonary artery, increased pulsation of the heart and great vessels and pulmonary congestion. These abnormalities, however, are not in themselves specifically diagnostic findings of patent ductus arteriosus; they are merely confirmatory evidence.

INDICATIONS FOR OPERATION

In formulating an opinion as to the advisability of operation in uncomplicated patent ductus arteriosus, the chances of development of complications in the untreated patient must be weighed against the dangers of operation. The author's experiences in 100 cases treated surgically warrant advising operation in all patients with this lesion except those in their thirties or older who have no progressive cardiac hypertrophy or incapacitation due to having had a shunt for so long. The optimum age appears to be about three years, although the author has operated upon some patients younger than that. The older the patient the more difficult the operation technically. The vessels of the young patient are far more elastic and the tissues may be dissected with ease, in contradistinction to those of the adolescents and adults. If patent ductus arteriosus is complicated by subacute bacterial endocarditis, operation should be done after prolonged and intensive treatment with penicillin. The fact that penicillin may cure bacterial endocarditis does not justify advising a patient not to have the operation. It must be assumed that the damage done by infection is not eradicated by penicillin. Moreover, an apparent cure by penicillin does not necessarily prevent recurrence of subacute bacterial endocarditis. The fact remains that the presence of a shunt throws a burden on the heart so that in the majority of cases cardiac hypertrophy develops. Furthermore, the newer technique of dividing the ductus and suturing the wall of the pulmonary artery and aorta, not only prevents the chance of reestablishing the shunt but it also offers greater assurance against the development of subacute bacterial endocarditis. In young patients there is no sure method of predicting in which ones cardiac hypertrophy or subacute bacterial endocarditis will develop; and as long as the surgical morbidity and mortality rate is very low, it is most urgent to treat these patients surgically.

OPERATIVE TECHNIQUE

The author uses a posterolateral transpleural approach, resecting a long segment of the fourth rib posteriorly. With the rib spreaders applied, the operative exposure is far superior to that obtained by the anterior approach which the author used in the first 41 cases. The lung is allowed to collapse, the mediastinal pleura over the ductus is incised and the ductus is dissected all the way around. Cotton tapes are passed around the ductus to aid in a thorough and complete dissection of the tissues about the vessel and the reflection of tissue from the pericardium over the ductus, pulmonary artery and aorta. Four hemostats are placed across the ductus, which is then divided between the inner two hemostats as proposed and described by Gross.[3] Then the inner two hemostats are removed and both cuffs of the ductus distal to the remaining hemostats are sutured with fine silk on atraumatic needles. The remaining two hemostats are then removed and the suture line covered with pledgets of gelfoam. The mediastinal pleura is then sutured and after the lung is expanded the chest wall is closed in layers without drainage.

It is the author's belief that division of the ductus rather than ligation in continuity should be done in every instance in which it is surgically feasible. Occasionally the ductus may not appear long enough, but if the dissection is thorough, in the vast majority of such cases it can be "lengthened"; and the clamps may encroach a trifle on the walls of the vessels to permit the division of the ductus. Mobilizing the aorta and pulmonary artery is a great aid in preparing the ductus for division, and the experienced surgeon will have no difficulty getting enough length of the ductus to divide. The division of the ductus insures against reestablishment of the fistula and possible subsequent development of subacute bacterial endocarditis and is therefore preferable to the procedure of simple ligation.

Ether-oxygen endotracheally has been used for anesthesia in the vast majority of these operations and is preferred to Cyclopropane (trimethylene).

POSTOPERATIVE CARE

Postoperative care has been rather simple. Very few of the patients have required glucose infusions; blood transfusion is contraindicated except where a hemorrhage indicates its use; and in the last 30 operations only four patients have required pleural aspirations. Penicillin is now administered for 24 hours before operation and for 72 hours postoperatively. Usually the patients are discharged from the hospital seven days after operation.

OPERATIVE COMPLICATIONS

Recently a detailed account of the postoperative complications in the first 61 patients of this series was reported.[4] In the last 39 cases, only five patients have needed pleural aspirations and only one has had a disturbing complication—namely, transient pericardial effusion which absorbed spontaneously and which kept the patient in the hospital only 16 days instead of the usual seven days postoperatively. Convalescence in this case was uneventful. Briefly, the complications in 100 successive operations (58 ligations and 42 divisions) were as follows: 27 patients required pleural aspiration; two developed empyema necessitating rib resection (both made good recovery); in two of the earlier cases in which ligation was done with umbilical tapes, aortobronchial fistula developed at the site of the tied knots. In one of these, surgical intervention was necessary, while in the other healing was spontaneous. Both patients have been well for a long time. These cases were reported in detail elsewhere.[4] Five patients had pulmonary atelectasis which cleared with more intensive administration of carbon dioxide and postural treatments. In two cases in which ligation had been done, persistent recurrent laryngeal nerve palsy developed although meticulous care had been taken to avoid injury at the time of operation. These cases were among the earlier in the series, and it is assumed that the irritation or pressure of the knots of tape in close proximity to the recurrent laryngeal nerve caused this complication. There were no wound infections but the incidence of keloid in the supramammary scars was one of the reasons for abandoning the anterior approach.

Two patients in the series of 100 died. One, a child operated upon in 1939, developed Staphylococcus aureus endarteritis about 30 days after ligation of the ductus and died 48 days postoperatively. The ligatures had cut through the walls and a superimposed blood stream infection resulted in vegetations on both pulmonary artery and aortic walls. The details of this case are reported elsewhere.[5] The other died of cardiac arrest following hemorrhage during dissection of the ductus.[4] In the last 40 cases (35 divisions and five ligations) no serious complication has occurred.

RESULTS

The beneficial effects of the operation in children with developmental retardations has been very obvious. Gain in weight, appetite and strength and capacity for activity has been a universal effect. Patients who had palpitation, tachycardia, fainting spells and ease of fatigue were soon completely asymptomatic. A rise in diastolic blood pressure and a decrease of the pulse pressure were noted either at once or within the first few days after operation. A decrease in the size of the heart in all patients who had cardiac hypertrophy before operation was noted within a month or two afterward.

In all of the 100 cases, patent ductus arteriosus was found at operation and either ligated or divided; there were no mistaken diagnoses. Ninety-eight of the 100 patients operated upon are alive, and only one of them is not entirely well. In that one patient, a diabetic, a fistula has reestablished itself since ligation several years ago, and the patient has a low cardiac reserve. None of the 42 patients who were operated upon for division of ductus had consequential residual murmur, but ten of the 58 in whom ligation was done had a continuous murmur which persisted or which returned later after discharge from the hospital. The importance of the surgical division of the ductus, rather than ligation, is borne out in this series.

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Substernal Goiter and Pulmonary Emphysema

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SUMMARY

Pulmonary emphysema is not an infrequent complication of tracheal compression due to goiter.

In many cases the goiter is in the mediastinum and therefore overlooked.

Among 13 patients with this combination of disease, chronic cough, dyspnea and wheezing were the chief respiratory symptoms. Ten of the 13 patients also had hyperthyroidism; in eight of the ten the disease was of the "masked" variety and both the thyrotoxicosis and the mediastinal mass were overlooked.

Early recognition and surgical removal of substernal goiter may prevent or retard otherwise irreversible and progressive tracheobronchopulmonary disease.

Medical management of such cases with thiouracil preparations may lessen the toxic symptoms but probably will not affect the mechanical compression of the trachea.

THE symptoms of tracheal compression due to substernal or intrathoracic goiter have been adequately described by many authors.[2, 3, 8, 9] Cough, paroxysmal or constant dyspnea, wheezing, asthmatic attacks, "choking spells," recurrent bronchitis and hoarseness are the principal symptoms but all are not necessarily present in a given case. Such symptoms may readily be ascribed to primary bronchopulmonary disease and the goiter may be overlooked. This is especially true when there is no goiter in the neck. Dramatic relief of the symptoms of obstruction frequently follows operation, but irreversible tracheal and pulmonary changes may persist if the tracheal obstruction has been of long duration.[2]

For some time the authors have been impressed with the high incidence of chronic pulmonary emphysema in patients with substernal goiter. These patients had long-standing tracheal obstruction due to substernal goiter which was not diagnosed. For the most part they had "masked" hyperthyroidism[4, 5, 6, 7] without significant enlargement of the thyroid gland in the neck. Furthermore, the substernal goiter was not always apparent in the routine posterior-anterior chest film because the gland was small or localized under the manubrium (Cases 10 and 13 in Table 1). Fluoroscopy and lateral and oblique x-ray views were sometimes necessary to visualize the mediastinal mass and the tracheal compression.

It is pertinent at this time, when thyrotoxicosis is often treated with antithyroid substances without operation, to reemphasize the purely mechanical complications of goiter. The possibility of tracheal compression should be considered in all patients with goiter or hyperthyroidism, especially when there are symptoms or signs of bronchopulmonary disease. It might even be wise to adopt the attitude that substernal goiter should be considered in all cases of emphysema.

Clinical data of 13 selected cases which illustrate different aspects of this problem are summarized in Table 1. In every instance there was x-ray evidence of pressure on or distortion of the trachea. All but three patients (Cases 2, 5, and 8) had hyperthyroidism. In no instance was there a history of bronchial asthma; personal and family histories of allergic manifestations were not present, nor was there eosinophilia. Factors predisposing to chronic bronchopulmonary infection, such as pertussis or other acute or recurrent infections, were not found. There was no evidence of primary pulmonary disease such as tuberculosis or silicosis.

Cough was the most common symptom (nine cases) and was present for at least one year before treatment. If the cough had been present for two years or less, considerable improvement followed removal of the obstructing goiter (Cases 7, 8, and 12). The degree of improvement in the other respiratory symptoms such as difficulty in breathing, hoarseness, "asthma," wheezing, or strangling when recumbent also largely depended upon the duration of tracheal obstruction. In some cases the thyrotoxicosis *per se* accentuated the degree of dyspnea. The only complete cures of respiratory symptoms occurred in a 28-year-old woman who had had symptoms for only 18 months (Case 8) and in a 68-year-old man who had had hoarseness and dysphagia for only three months (Case 2). On the other hand, a 52-year-old male who had no respiratory symptoms but in whom there was objective evidence of obstructive emphysema developed progressive pulmonary changes during the next 17 years even though the tracheal compression was relieved (Case 4). He is now 70 years old and well except for emphysema. In this case the pulmonary changes had become irreversible before subjective symptoms appeared. It is not surprising that the patients who had had respiratory symptoms for five to twenty years showed no improvement after operation (Cases 1, 6, 11, and 13). Case 11 warrants a more complete report because it illustrates the difficulties

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in diagnosis and the complications of prolonged tracheal obstruction and chronic pulmonary emphysema.

CASE REPORT

Case 11.—A 52-year-old male was admitted to the Peter Bent Brigham Hospital, Boston, on February 14, 1945, complaining of paroxysmal nocturnal difficulty in breathing which was relieved by sitting upright in bed. This difficulty had been present for 20 years. For at least 12 years the patient had been exceptionally nervous and noted frequent "heaviness" over the sternum with excitement or exertion, and for ten years he had had an almost continuous hacking cough and dyspnea even at rest. According to the patient, medical consultants had ascribed these symptoms to a "chronic nervous breakdown." During the preceding year the patient had noted irregular pulse, orthopnea and ankle edema. Direct questioning revealed that he had

Table 1.—*Clinical Data on 13 Patients with Substernal Goiter*

Case	Symptoms	Goiter	Trachea by X-ray	Chest Findings	B.M.R.	Postoperative Result
1.—Female Age 63	Cough. dyspnea, 5 yr. Weakness, 6 wk.	205 gm. thyroid mainly substernal	Narrowed	A-P diameter increased. Wheezes.	+57%	Cough and wheezes present 2½ yr. later although trachea normal. Thyrotoxicosis cured.
2.—Male Age 68	Dysphagia, hoarseness, 3 mo.	Entirely intrathoracic; behind trachea and esophagus	Compressed and displaced to right	A-P diameter increased. Hyperresonant. Breath sounds diminished.	Not done	Immediate relief of symptoms.
3.—Male Age 61	Dyspnea, 2 yr. Life-long cough.	Entirely intrathoracic (toxic adenoma)	Compressed and displaced to left	A-P diameter increased. Breath sounds diminished. Rales in bases.	+27%	Trachea normal. Cough and respiration improved. Died 3½ yr. later of heart failure.
4.—Male Age 52	Nervous, palpitation, weight loss, 10 wk.	Slightly enlarged in neck. Gland mostly substernal	Narrowed	A-P diameter increased. Hyperresonant. Coarse rales.	+98%	Progressive emphysema and bronchitis during next 17 yr. although tracheal obstruction removed.
5.—Female Age 52	Strangling, wheezing, 1 yr. Swollen neck, 10 yr.	Large nodular goiter in neck extended below manubrium	Narrowed and displaced to right	Wheezes.	+10%	Trachea normal. Respiratory symptoms unchanged 1½ yr. later.
6.—Male Age 45	Cough, 10 yr. Dyspnea, perspiration, 1 mo.	Mostly substernal; nodule in right lobe	Narrowed and displaced to left	A-P diameter increased. Hyperresonant. Breath sounds diminished. Coarse rales.	+75%	Trachea normal. Thyrotoxicosis cured. Cough still present 2½ yr. later.
7.—Male Age 63	Dyspnea, cough, 1 yr.	Mostly substernal; small nodule in right lobe	Narrowed and displaced to right	A-P diameter increased. Breath sounds diminished.	+74%	Dyspnea gone. Slight cough persisted 3 mo. later.
8.—Female Age 28	Cough, dyspnea, 1½ yr.	5x6 cm.nodule in right lobe with substernal extension	Narrowed and displaced to left	Expiration prolonged.	—6%	Complete relief 1 mo. later.
9.—Female Age 65	Cough, 40 yr. Weakness, anorexia, 5 yr.	Mostly substernal	Compressed anteriorly	A-P diameter increased. Breath sound diminished. Many basal rales.	+41%	Thyrotoxicosis cured. Moderate cough persists 10 mo. later.
10.—Male Age 55	Angina, 3 yr. Tremor, 2 yr. Heat intolerance, 1 yr.	Entirely intrathoracic	Compressed anteriorly	Barrel-shaped. Breath sound diminished. Wheezes.	+36%	Under treatment with propyl thiouracil (see text).
11.—Male Age 56	Nocturnal dyspnea, 20 yr. Cough, 10 yr. Nervous, perspiration, 12 yr.	Almost entirely intrathoracic	Narrowed and displaced to left	Barrel-shaped. Hyperresonant. Breath sound diminished. Wheezes.	+30%	Progressive emphysema with wheezing, cough and development of cor pulmonale during next 3 yr.
12.—Female Age 42	"Asthma," choking spells, cough, 2 yr.	250 gm. thyroid almost entirely intrathoracic	Narrowed and displaced to right	A-P diameter increased. Wheezes.	+23%	Greatly improved. Slight cough and wheezing only with colds during next 8 yr.
13.—Male Age 57	Asthma, cough, 5 yr. 60-lb. wt. loss in 8 mo. Nervous for yr.	Almost entirely intrathoracic	Compressed anteriorly	A-P diameter increased. Hyperresonant. Prolonged expiration. Wheezes.	+49%	Thyrotoxicosis cured. Progressive emphysema with wheezing and cough during next 7 yr.

perspired freely and had preferred cold weather "for years." The rest of the history was non-contributory. Physical examination revealed a tall, obese, nervous male who was 74 inches in height and weighed 228 pounds. The temperature was 98.6, pulse 110, respirations 28 and blood pressure 160 mm. of mercury systolic and 100 diastolic. There was slight bilateral exopthalmos. A fine tremor of the hands was present. The skin was warm and moist. The thyroid gland showed very slight enlargement of the right lobe on palpation; there was no bruit. The chest was emphysematous; the anterior-posterior diameter of the chest was enormous, measuring 30 cm. Wheezes were scattered throughout the lung fields. The heart was enlarged to percussion. The rhythm was grossly irregular; the rate was 124. There were no murmurs. Slight edema at the ankles was noted. Basal metabolic rate was plus 30 per cent. An electrocardiogram showed auricular fibrillation, no axis deviation and low voltage. The circulation time was 28 seconds (decholin). The vital capacity of the lungs was 3,000 cc. in 8 seconds. X-ray examinations revealed a substernal mass which compressed the trachea and displaced it to the left. The heart was 20 per cent larger than normal by height-weight ratio. After ten days of therapy with Lugol's solution the basal metabolic rate fell to plus 8 per cent.

On March 9, 1945, subtotal thyroidectomy was performed and a hyperplastic right lobe weighing 92 gm. was removed from the retrosternal space. After operation the basal metabolic rate was plus 5 per cent, the heart rhythm became normal and the circulation time was 18 seconds. No further specific therapy was given. Nine months later the patient was readmitted for study because of increasing dyspnea. At that time the heart size was 10 per cent above normal. The blood pressure was 140 mm. systolic and 98 diastolic. The venous pressure was 11 cm. of water and the circulation time was 18 seconds. The vital capacity was 2,300 cc. in 12 seconds. All evidence of hyperthyroidism had disappeared. The lungs showed no congestion. Cardiac catheterization on January 9, 1946, confirmed the clinical diagnosis of chronic cor pulmonale due to chronic emphysema.[1] The mean pressures in the pulmonary artery, right ventricle and right atrium were 57/38, 55/29 and 25 mm. of mercury, respectively, and showed marked respiratory variations. The arterial oxygen saturation was 88 per cent. The cardiac output was reduced, the cardiac index being 2.43.

During the next two years the patient was treated with digitoxin, aminophylline, ephedrine and intermittent intramuscular injections of mercuhydrin. Although still dyspneic when last observed in January 1948, the patient was able to carry on his work as a hospital attendant.

Comment: This patient undoubtedly had a mediastinal goiter for many years. Whether it preceded the pulmonary emphysema cannot be determined. The possibility of mediastinal goiter first came to mind because he was suspected to having masked thyrotoxicosis. The latter diagnosis was considered because of the presence of a warm moist skin, sweating, the preference for cold weather and the finding of auricular fibrillation not explicable on other more common grounds.

Case 12 also demonstrated the difficulties in diagnosis and the complications of tracheal compression:

CASE REPORT

Case 12.—A 42-year-old woman was admitted to the Peter Bent Brigham Hospital on February 14, 1928, because of extreme exhaustion of four months' duration. She had chronic mild rheumatoid arthritis of seven years' duration. In 1922 a slight enlargement of the anterior neck was noted by the patient, and this had remained unchanged up to the time of admission. In 1926, non-seasonal "asthma" began and it also had persisted to admission. A chronic cough and episodes of "choking" sensations had also been present during those two years. Physical examination revealed a poorly nourished female. The temperature was 98.6, the pulse rate 72, the respirations 18 and the blood pressure 100 mm. of mercury systolic and 70 diastolic. The thyroid gland was diffusely enlarged to a moderate degree. There was no bruit. The heart was normal. The anterior-posterior diameter of the chest was increased. Inconstant wheezes were present throughout the lung fields. The skin was normal. There was slight prominence of the right eye and a right lid-lag. The basal metabolic rate varied from plus 13 to plus 23 per cent. X-ray studies revealed a soft mediastinal shadow and displacement of the trachea to the right. The patient refused operation.

Five years later the patient returned, the condition unchanged, and on March 21, 1933, total thyroidectomy was performed. A very large (250 gm.) hyperplastic substernal thyroid gland was found adherent to the trachea and was removed without undue difficulty. The postoperative basal metabolic rate was minus 8 per cent. The "asthma" and other symptoms were completely relieved. When last observed almost ten years later the patient was in good health except for arthritis. Wheezing and a slight cough had recurred only with upper respiratory infections in the eight years following thyroidectomy.

Comment: In this case the diagnosis of goiter was obvious although the degree of toxicity was so slight that it had been overlooked. Operation was advised and later performed mainly because of the mechanical compression on the trachea. This proved curative.

In another case the patient had masked thyrocardiac disease with emphysema. There was a small substernal goiter which was difficult to demonstrate:

CASE REPORT

Case 10.—A 55-year-old male was admitted to the Peter Bent Brigham Hospital on January 29, 1948, because of progressive angina pectoris of three years' duration. He used 4 to 12 nitroglycerin tablets daily. Direct questioning revealed that the patient had a slight tremor of the hands which had interfered with writing during the preceding two years. For a year preceding hospitalization, mild intolerance to heat and an increased appetite without gain in weight had been noted by the patient.

Physical examination revealed an alert male with a salmon-pink complexion. The skin of the face appeared distinctly suffused, and that of the rest of the body was warm and quite moist. The temperature was 98°, the pulse rate 80, respiration 16, and blood pressure 140 mm. of mercury systolic and 70 diastolic. The eyes were slightly prominent. The thyroid gland was not palpable. The chest was barrel-shaped and hyperresonant. The breath sounds were diminished. There were a few inspiratory wheezes. A slight tremor of the fingers was present. The basal metabolic rate varied from plus 20 to plus 36 per cent. The blood protein-bound iodine was 10 gamma per 100 cc., considerably above normal. An electrocardiogram showed right bundle branch block. The vital capacity of the lungs was 2,900 cc. in 14 seconds. The circulation time was 18 seconds, and the venous pressure was 115 mm. of water. A posterior-anterior x-ray film of the chest showed emphysema. The routine x-ray report made no mention of substernal goiter. On repeat examination when the roentgenologist was asked to look for a submanubrial goiter, such a mass was identified.

It was decided to observe whether the anginal state could be controlled with medical therapy. The patient was given 10 drops of Lugol's solution thrice daily for two weeks and 100 mg. of propyl thiouracil thrice daily for two days followed by 50 mg. thrice daily thereafter. The improvement was striking. In two months the patient was able to walk a mile or two without stopping and had no anginal pain. However, subtotal thyroidectomy might yet be advisable to relieve the pressure on the trachea and possibly retard the progress of the emphysema.

Comment: Thyrotoxicosis was suspected at once because of the patient's salmon-pink complexion, slight stare of the eyes and warm, moist skin. It was only then that a history consistent with that diagnosis was elicited. The presence of a mediastinal goiter seemed likely because of the absence of a palpable thyroid gland in the neck and the signs of pulmonary emphysema. On the basis of this clinical concept, repeat x-ray studies were made which demonstrated the substernal mass.

COMMENT

The 13 cases reported herein are by no means all that were observed at the Peter Bent Brigham Hospital. Many similar cases of emphysema occurred in which the gland was obviously visible in the neck. In others in which the patients had mediastinal goiter the evidence of emphysema was less striking. These 13 were selected as outspoken examples to illustrate the clinical features under discussion.

In all patients with definite thyrotoxicosis or goiter the possibility of tracheal compression ought to be studied. The authors are impressed with the high incidence of pulmonary emphysema in patients with goiters, although it is difficult to prove a casual relationship in some cases. If hyperthyroidism is suspected the presence of a substernal mass has to be considered, particularly when little or no enlargement of the thyroid can be detected in the neck (Cases 3, 4, 10, 12, and 13). Finally, in all patients with emphysema the possibility of mediastinal goiter causing tracheal compression has to be entertained. Such a goiter may be the cause of many otherwise unexplained instances of dyspnea and decreased vital capacity.*

When the degree of tracheal compression is slight, pulmonary emphysema may develop gradually over the course of many years without subjective complaints (Cases 4 and 10). The clinical symptoms which should direct attention toward this possibility are the suffused face of the patient, prolongation of expiration, an increase in the anterior-posterior diameter of the chest and other objective signs of obstructive emphysema. X-ray examination may be quite helpful but is not conclusive. A large mediastinal mass is readily detected; a smaller one can easily be overlooked on routine examination unless the roentgenologist is asked to look for it. Some may be elusive even when searched for. The actual pressure effect on the trachea may or may not be obvious. It is not unlikely that a slight degree of constant pressure, difficult to visualize by roentgenologic measures, may be productive of a chronic emphysematous state.

Surgical removal is obviously the only treatment for a non-toxic goiter which is producing compression of the trachea. But alternative methods of treatment with antithyroid substances or radioactive iodine are now available in the treatment of toxic goiter. Such non-surgical methods of therapy should not be used unless careful investigation shows no mechanical interference of the trachea. If the goiter is substernal or producing tracheal compression and/or distortion it should be removed surgically in order to prevent or arrest irreversible, progressive bronchopulmonary disease.

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*The following experience is a telling illustration of some of the above considerations. One evening at a conference of several physicians the value of vital capacity determinations was being discussed. Some of the men present thought that its main usefulness was in following the progress of patients with cardiac disease once the diagnosis had been established. The authors insisted that at times it was also helpful in leading to fundamental diagnoses. At this point one of the physicians said that for many years he had had a low vital capacity (3,200 cc.) and yet had no heart disease and felt quite well. In rebuttal, thinking that this particular individual should normally have a vital capacity of about 4,500 cc., the authors stated that if his heart were normal there was reason to suspect conditions like emphysema, mediastinal goiter or other mediastinal masses. The interesting point was that this individual promptly replied that some ten years before a large mediastinal goiter had been removed.

Results of Medical and Surgical Management in Ten Cases of Congenital Megacolon

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SUMMARY

Of 20 patients under 15 years of age with proven diagnoses of megacolon, ten were treated surgically with either partial colectomy or resection of the entire colon down to the rectosigmoid junction after thorough trial of medical management. Follow-up shows five of these patients as 100 per cent relieved, one as 75 per cent relieved. Three were entirely well a few months after operation but have not been heard from since. One died of peritonitis on the 16th postoperative day.

In four cases in which lumbar sympathectomy was done, the result was partial, temporary or no improvement.

Of the patients not operated upon, several have been lost to follow-up, some are doing well on medical treatment, one died in early infancy, and resection is being considered for two.

For children with congenital megacolon the authors recommend first a thorough trial of medical treatment consisting of diet, vitamins, drugs and enemas. This should be started as soon as possible after the diagnosis is made, in an attempt to prevent the distention and hypertrophy of the bowel from progressing. If distention remains after a reasonable trial period and the child is not gaining weight adequately, requires repeated hospitalization, and is three years of age or more, then resection of the affected portion of the colon is indicated. The risk of operation has been somewhat reduced with better supportive measures and chemotherapy now available. Since infants and extremely young children do not stand operation on the colon as well as older children, decision to operate should take into consideration the age of the patient. In the reported series, the patient who died following operation was the youngest—2½ years of age.

MEGACOLON, or Hirschsprung's disease, is of relatively rare occurrence but is seen in a medical center often enough to require establishment of a definite regimen for its control. In the last 12 years at the University of California Hospital, there have been about 20 proven cases of this condition in children under 15 years of age. Ten of these patients have had either partial colectomy or resection of the entire colon down to the rectosigmoid junction, and these will form the basis of this report. The first six have been reported upon in more detail previously.[11] Several of those not operated upon have been lost to follow-up; some are doing well on medical treatment; one died in early infancy; and resection for two is being considered.

This entity has been recognized since Hirschsprung's description 60 years ago. However, the exact cause of the disease has not been determined as yet. It is fairly well established that there is an imbalance of the autonomic nervous system controlling bowel function. The result of stimulation of the parasympathetic system is to increase peristalsis and relax the internal sphincter, whereas stimulation of the sympathetic nerves will inhibit peristalsis and tighten the sphincter. The beneficial results obtained with the use of the counteracting drugs, Mecholyl (sympathetic stimulant) and Syntropan (parasympathetic depressant), as well as the results from lumbar sympathectomy in megacolon, support the imbalance theory but shed no light on the cause of the imbalance. Present knowledge is limited to the fact that in some cases the disease is caused by underactivity of the parasympathetic nerves, while in others overactivity of the sympathetic nerves is the cause.

At the time of the earlier report,[11] the reports in the literature, with the exception of those of Ladd and Gross,[7] and Dixon,[2] mentioned resection of the colon in megacolon only to condemn it. Since then several observers — Whitehouse,[10] Grimson,[4] and Herrmann[5]—have advocated the operation for patients who do not respond to medical treatment. There are some investigators who still feel that lumbar sympathectomy is the operation of choice. In four of the cases in the authors' series, this operation gave partial, temporary or no improvement. It is conceded even by those who advocate the operation that sympathectomy results in a greater risk of later volvulus and perforation, even though the immediate result may be good. It does not alter the

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hypertrophied colon or the redundant mesentery. There is also the consideration of probable sterility in the male.

The symptomatology and findings in the ten cases of megacolon observed by the authors varied somewhat in degree but they had these points in common:

1. Severe constipation, starting either from birth or within the first few months;
2. Failure of ordinary laxatives or suppositories to produce normal bowel movement, and the necessity of repeated enemas;
3. Increasing abdominal distention;
4. Malnutrition (all but one case);
5. Absence of demonstrable obstructive lesion;
6. Marked dilatation of a portion or all of the colon on roentgenographic study.

Careful diagnostic procedures were carried out before operation was considered. The child was hospitalized for thorough cleansing of the bowel. This often required several days, as it was exhausting for both the patient and the nurse. It required 32 liters of solution at one session for partial cleansing of one 13-year-old child. When the abdomen was flat and the colon relatively clear, x-ray studies were made, with Umbrathor used for the contrast medium, because it is much easier to remove than even a thin barium suspension. Sigmoidoscopic examination was done to rule out obstructive lesion. Some of the patients received spinal anesthesia but since little in the way of useful information was obtained, it is not used routinely any longer.

Medical treatment was begun by placing the child on a high caloric balanced diet with added vitamins, especially vitamin B; mineral oil was given to soften the stool. Mecholyl, which is a parasympathetic stimulant, was given one hour after breakfast in an initial dose of 50 mg., and gradually increased up to tolerance or effect. Some patients received as much as 600 mg. daily. In contrast to the results reported by some observers, several of the patients treated by the authors had moderately severe reactions such as vomiting, sweating, decrease in pulse rate, and (in one case) collapse. These reactions were readily controlled with atropine. Mecholyl[8] has been the most satisfactory of the drugs although Syntropan[6] has been given a trial in most of the patients.

After the diagnostic procedures were done and the medication started, most of the children were sent home for a trial on the medical regimen. When it was decided by the pediatric and surgical staffs that adequate improvement had not been obtained on the medical program, resection was advised. Penick[9] considered medical treatment a partial failure if more than one enema a week was necessary. The authors' criteria for determining the success of medical treatment were the general well-being of the child and the control of the abdominal distention. Many of the children had daily bowel movements but the stools were small, and as the abdomen remained distended the movements were interpreted as overflow and not true evacuations. It was recognized that the giving of medicines and attention to bowel habits and diet was more than some of the mothers could manage. The age of the patient was also a definite factor in determining treatment, since infants and young children do not stand operation on the colon as well as older patients. The youngest patient in the authors' series, 2½ years of age, was the only one who died.

The surgical procedures varied somewhat from the earlier to later cases. In the first case a Mikulicz operation was done, since the patient had a volvulus of the sigmoid at the time of operation. The next group had cecostomy followed by resection of the involved portion of the colon. In most of these patients there was a definite line of demarcation between normal and affected bowel. One patient required another operation three and a half years later for resection of the ascending colon. Because of this, the last two patients in the series, in whom the whole colon was found to be involved, had a one-stage operation with resection of the entire colon down to the rectosigmoid junction. In none of the ten patients was there involvement of the rectum, so that a normal segment was available for the distal anastomosis. Grimson[3] pointed out that medical management of a patient with a normal rectum is difficult and that there is great danger of impaction and perforation. He also advocated operation for this group.

Prior to operation the child was admitted to the hospital for a thorough cleansing of the bowel, a course of sulfasuxidine (when it became available), and correction of anemia if that was present. Sulfonamides were given parenterally after operation, and in the last two cases penicillin was used. The blood proteins were maintained by plasma, if necessary. Fluids, electrolytes, and vitamins were given parenterally. The postoperative course was not always smooth, and some of the children lost a great deal of weight. However, convalescence was rapid once they were on their feet again. One patient (Case 2 in Table 1) gained 35 pounds in one year after a second operation. Her last visit to the clinic was as an adolescent girl of 14 who wished a diet to reduce her hips; no reduction of the abdomen was needed.

The appearance of the colon at operation was remarkably similar in all patients. There was dilatation of the affected colon to many times the normal size. The wall was thickened, soggy, and lifeless. The appearance has been likened to that of thick wet leather. The taeniae and haustra were absent. The sigmoid and its mesentery were usually elongated, a factor predisposing to volvulus. Microscopic examination showed the wall to be hypertrophied and edematous with lymphoid hyperplasia throughout. In most cases myenteric nerve plexi were prominent. As it is hard to conceive of the return of the bowel to normal after such hypertrophy, even considering the excellent regenerative power of children, it would appear to be advisable to check the process at the stage of dilatation and before hypertrophy is reached.

Postoperative roentgenographic studies in several cases have shown evidence of an enlarged colon.

Table 1.—*Treatment and Results in Ten Cases of Megacolon*

Case	Involvement Shown by X-ray	Mecholyl	Sympathectomy Age	Year of Operation	Resection	Age	Results
1. M.	Mid-transverse to distal ½ sigmoid	No	Bilateral at 7½ years	1936	Sigmoid colon	12	Excellent at present (24 years)
2. F.	Whole colon; rectum normal	No	No	1939 1942	Mid-transverse to sigmoid Complete colectomy	5 8½	Excellent at present (14 years)
3. M.	Whole colon; rectum normal	Fair results	Bilateral at 3 years	1941	Left colon to rectum	4½	Excellent at present (10½ years)
4. M.	Sigmoid	Poor results	No	1942	Sigmoid	3½	Excellent — 6 mo. postoper. No report since
5. F.	Sigmoid	No response	No	1942	Sigmoid	4	75% relief on Mecholyl (10 years)
6. M.	Left colon; rectum normal	No response	No	1942	Left colon to rectum	6½	Excellent—10 mo. postoper. No report since
7. M.	Whole colon; rectum normal	No response	Bilateral at 4¼ years	1944	Sigmoid	4½	Excellent immediately. No report since
8. M.	Left colon; rectum normal	No response	Left - 2 years Right - 4 years	1945	Left colon to rectum	13½	Excellent at present (16¾ years)
9. M.	Whole colon; rectum normal	Some response; not adequate	No	1947	Complete colectomy	5	Excellent at present (5¾ years)
10. M.	Whole colon; rectum normal	Some temporary response	No	1947	Complete colectomy	2 years 7 mos.	Died on 16th postoper. day

but without clinical difficulty. As yet it is too early to be certain that there will not be recurrence of the old difficulty in these cases. The status of the patients 20 to 30 years from now will give the answer. At present the longest follow-up in the series is 12 years.

As may be seen in Table 1, there were 10 children in the series, ranging in age from 2½ to 13½ years at the time of the colon resection. Roentgen examination showed three patients (Cases 1, 6 and 8) had involvement of the left half of the colon; two patients (Cases 4 and 5) of the sigmoid alone; and five patients (Cases 2, 3, 7, 9 and 10) had involvement of the entire colon. All but the first two were given mecholyl for a trial period before operation, some with partial but inadequate response. Bilateral lumbar sympathectomy was carried out in four patients (Cases 1, 3, 7 and 8) with either temporary or no response. Eight had partial colectomy (one required a second operation for more complete resection three and a half years later). Three patients had resection of the entire colon to the rectosigmoid junction; one of them died on the 16th postoperative day of peritonitis from perforation of the rectal stump. Follow-up shows five patients as 100 per cent (mothers' evaluation) relieved, one as 75 per cent relieved; three were entirely well a few months after operation but have not been heard from since, although before the operation their parents had not hesitated to get them to the office when that was considered necessary, despite the difficult transportation during war years.

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Dysplasia of the Hip: A Factor in the Development of Static Osteoarthropathy

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SUMMARY

Dysplasia of the hip is associated with a shallow acetabulum. It may be present and unrecognized until middle age when arthritic changes develop as a result of repeated microtraumata. By that time the process is irreversible.

It can be recognized in infancy by roentgenographic study of the hips, and corrective measures can be taken to develop a normal hip and so prevent the crippling arthritis of later life. Although it is not certain that dysplasia develops in every person having a shallow acetabulum, this structural abnormality is known to be a strongly predisposing factor and therefore should be corrected.

DYSPLASIA of the hip is associated with a shallow acetabulum (Figure 1a). Any discussion of this subject must include the congenital dislocated hip, since the mechanism is the same for the two, except that in the congenital form the dysplasia has not reached the degree of true dislocation. Whether the fault lies in the failure of development of the head or of the acetabulum is still a disputed point. It is not the purpose of this paper to enter into the controversy as to the cause of dysplasia in congenital dislocation except to mention briefly the various theories.

The earlier investigators considered the origin of dysplasia of the hip to be on a mechanical basis, that is, that a relaxation and elongation of the surrounding ligaments and articular capsule permitted the head to dislocate and that lack of the stimulus to osseous growth around the acetabulum provided by the head resulted in hypoplasia of the ilium. The extent of this mechanism (according to the theory) would determine whether the head rested partly in a shallow acetabulum or would be completely dislocated.

In the past 30 years there has been another concept in which the primary fault is considered to be an inherent factor in the development of the acetabulum. Hart,[3] one of the exponents of this belief, has stated that the principal anatomical feature is the acclivity of the roof of the acetabulum which is increased over the normal. The hereditary factor, Hart concluded, is in a dominant hip dysplasia gene carried over from father to son. He based this conclusion on observation of several cases in which one member of a family had a congenital dislocation and others in the same family had a flat socket. He also noted that a patient with congenital dislocation of one hip might also have a flat socket in the other. Faber[2] also came to the same conclusion. He made a roentgenographic consanguinity study on members of the families of ten children with congenital dislocation of the hip and found that there were no dysplasias in the family on the maternal side while in the family of the father four cases of hip dysplasia without dislocation were found. In some of the families only a few individuals had a dislocation while many showed the hip dysplasia without dislocation, the dysplasia being three times more frequent than the actual dislocation.

Badgley[1] in 1943 disagreed with this view. He expressed the belief that the primary cause is interference with normal rotation of the limb buds and that in the dysplasias there is an increased anteversion of the head and neck. He pointed out that normally during fetal life an anteversion develops from 0 in the first two months to 35 degrees at birth. After birth the anteversion should diminish. Normally the increasing pressure on the back of the socket stimulates the deepening of the socket and increased growth on the posterior rim of the acetabulum. This stimulus lacking, the posterior rim does not develop and there is a gradual migration of the head posteriorly. The changes of the acetabulum are secondary and accommodative to the primary failure of rotation. Therefore, Badgley pointed out, these changes are correctible even after birth in the first year of life by maintaining internal rotation and abduction to aid the forces of internal rotation.

Whatever the cause, the fact remains that there is a close relationship between dysplasia of the hip, a flat acetabulum, and a congenitally dislocated hip. Since by abduction and internal rotation in infancy, preluxated hips can be made normal, early recognition of preluxation is important. The congenital dislocated hip will be recognized when the child

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begins to walk, but in the child with a flat socket changes in the hip will develop as the head adapts itself to the shallow acetabulum. Because of the inclination of the roof, the head in adapting itself will become large, broad and flattened, the neck short and wide, and coxa vara will develop. In the final stage it is often confused with healed slipped epiphysis or healed Perthes' disease. This will be

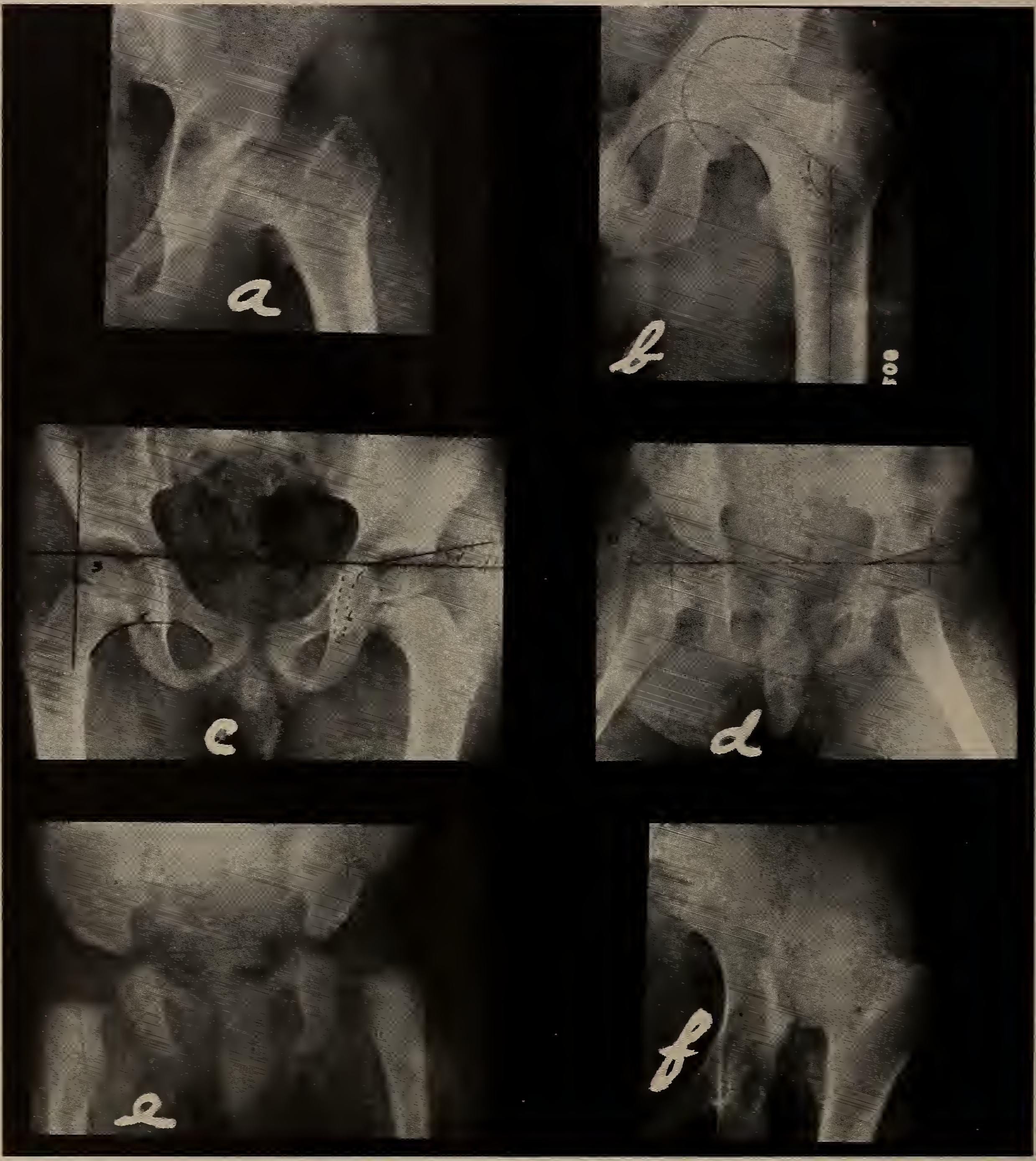

Figure 1.—(a) Shallow acetabulum. The acetabulum is shallow with only a small segment of a curve where a small portion of the head fits into the acetabulum. The head is enlarged, the neck is shortened; the shaft rides high in relation to the neck and is externally rotated.

(b) Normal. Acetabulum is a circular segment of about 170°. Upper border is horizontal. Two-thirds to three-fourths of head fits into acetabulum. Axis of neck forms an angle with shaft of about 130°. Line through fossa of head at right angles to axis of shaft extends through greater trochanter. Continuous curve between inferior margin of neck and inferior margin of pubis. '"Shenton's line."

(c) Normal development of acetabulum. (1) Y line through clear space in acetabulum. (2) Vertical line through lateral border of acetabulum. (3) Head of femur lies in medial lower quadrant. (4) Roof of acetabulum forms angle less than 20° with Y line. (5) Shenton's line. (6) Teardrop. Formed by floor of acetabulum and long border of the small pelvis.

(d) Inclination of the roof of the acetabulum is greater on the right side than on the left. It measures 33°; the other side measures 13°. The epiphysis of bone head lying in normal position. The head on the right is not as fully developed as the left.

(e) The acetabulum on the right measures 30°. The shaft is in normal relation to the acetabulum. The acetabulum on the left measures 45°. The head is luxated, lying in the outer lower quadrant.

(f) Congenital dislocation. The acetabulum is flat. The head rides in a false acetabulum in the wing of the ilium.

discussed later. It is inevitable that in middle life traumatic arthritis will develop from this poor mechanical structure because of the continuous pressure on the hip and frequent repeated microtraumata. Wiberg[5] in 1939 supported this view by presenting roentgenograms of 19 patients with primary hip dysplasia before and after development of secondary changes of osteoarthitis.

As groundwork for a study of changes of the dysplastic hip, consideration should be given first to the normal hip (Figure 1b). In the normal hip the head fits into the acetabulum for about two-thirds of a circle. The acetabulum is a circular segment of about 170 degrees, and the upper border tends to be horizontal. The axis of the neck meets the line of the shaft at an angle of about 125-130 degrees. Another line extending through the fovea of the head at right angles to the shaft will cross the greater trochanter.

The development of the acetabulum can best be studied in the child before union of the parts takes place (Figure 1c). In the normal hip joint of the newborn the acetabular cavity is divided into two equal parts by the Y line. This Y line is a prolongation of the horizontal line in the clear space between the two segments of the acetabulum which has not united. If a vertical line is dropped from the outer rim of the iliac roof of the acetabulum to the Y line, this region is divided into four right-angled quadrants. Normally the epiphysis for the head of the femur lies in the medial lower quadrant. As the child grows, the Y-shaped cartilage alters its direction so that the socket is divided into a smaller upper segment. The acclivity of the roof of the acetabulum as determined by the angle it makes with the Y line ranges from about 12 degrees to 30 in the newborn. This angle gradually decreases as the child grows until it becomes almost horizontal in the adult. The depth of the acetabular cavity is shown by the configuration known as the teardrop. This is not an anatomical structure but a shadow on a roentgenogram made up of three lines—a small curved line, a very long almost straight line, and a line connecting the two. These three lines form a drop resembling a tear and were first pointed out by Kohler,[4] who gave the figure its name. The arch of the tear figure is the contour of the acetabular cavity and corresponds to the acetabular wall. The small semicircular arch corresponds to the part of the bone where the anterior opening of the acetabular fossa curves around backward to the wall of the pelvis. The third straight line is the shadow of the wall of the pelvis running in the direction of the ray.

Two factors are involved in dysplasia of the acetabulum. One is the curve. Instead of the normal segment of a circle of about 170-175 degrees, the arc will be less than 170 degrees. The upper part of the roof, instead of being directed horizontally, is directed upward so that the angle with the Y line is increased. The greater the upward direction, the more pronounced the flatness of the acetabulum—up to 180 degrees as is sometimes found in the congenital dislocated hip (Figures 1d, e, f). It is the flattening that gives the tendency for the head to slip upward out of the fossa.

The other factor is the depth of the acetabulum. This can be determined by the shape of the previously mentioned teardrop shadow on a roentgenogram. The shallow acetabulum is manifested in increased width of this teardrop.

With the development of dysplasia there is also a retarded development of the epiphyseal nucleus of the femoral head on the side that is involved. Treatment early by abduction and internal rotation will often restore the acetabulum to normal (Figures 2a, b, c, d).

Patients with a dysplastic hip may go through early life absolutely free of symptoms. Others in early adult life may complain of a feeling of fatigue and sometimes they may limp slightly, especially after unusual exercise. This was especially noted in a military training camp where many men who had never before complained of hip pain reported to the dispensary after being subjected to long hikes. The complaint was hip pain and fatigue. In most cases, clinical examination disclosed no abnormality. Diagnosis can be made with certainty only with roentgenograms. In many cases there was a considerable degree of dysplasia without symptoms and the condition was accidentally discovered in the course of examinations made because of other complaints. However, as previously mentioned, although the condition may cause little or no distress in young persons, it is almost inevitable that in middle life the secondary changes of traumatic arthritis will develop because of the repeated microtraumata as shown by a loss of joint space, sclerosis, cystic areas of rarefaction, and many times a double acetabular wall with osteophytic deposits (Figures 2e, f).

As was noted in an earlier paragraph, the late changes in dysplasia of the hip may be confused with healed slipped epiphysis or healed Perthes' disease.

Perthes' disease usually occurs between the ages of three and twelve (figure 3a). Symptoms, including a limping, are always present and some patients have pain. It is a focal aseptic subchondral necrosis of the neck and the neighboring epiphyseal center of the head. It starts first as a rarefaction of that part of the metaphysis bordering the epiphyseal line, with the bone being replaced by fibrous tissue and cartilage. The process progresses into the interior of the head of the shaft, developing subchondral bone necrosis. The necrotic bone becomes fractured by weight-bearing, with a resulting deformity of the surface contour. Repair is slow, fibrous tissue replacing the bony fragments. The head becomes compressed and flattened, which accounts for the term coxa plana. There is also compression and expansion of the proximal end of the diaphysis. Traumatic arthritis at the site of the lesion is a late development (Figure 3b).

Slipped epiphysis, also known as adolescent coxa vara, begins in adolescence. It is found in children, in boys predominantly, who are overweight for their age and height and who have flabby, weak skeletal musculature and more than a normal amount of subcutaneous fat. Because of the abnormalities, some observers believe that endocrine disturbance may be an etiological factor, or at least that there may be a constitutional predisposition to a condition of this type. At first, in the pre-slipping stage, there is a

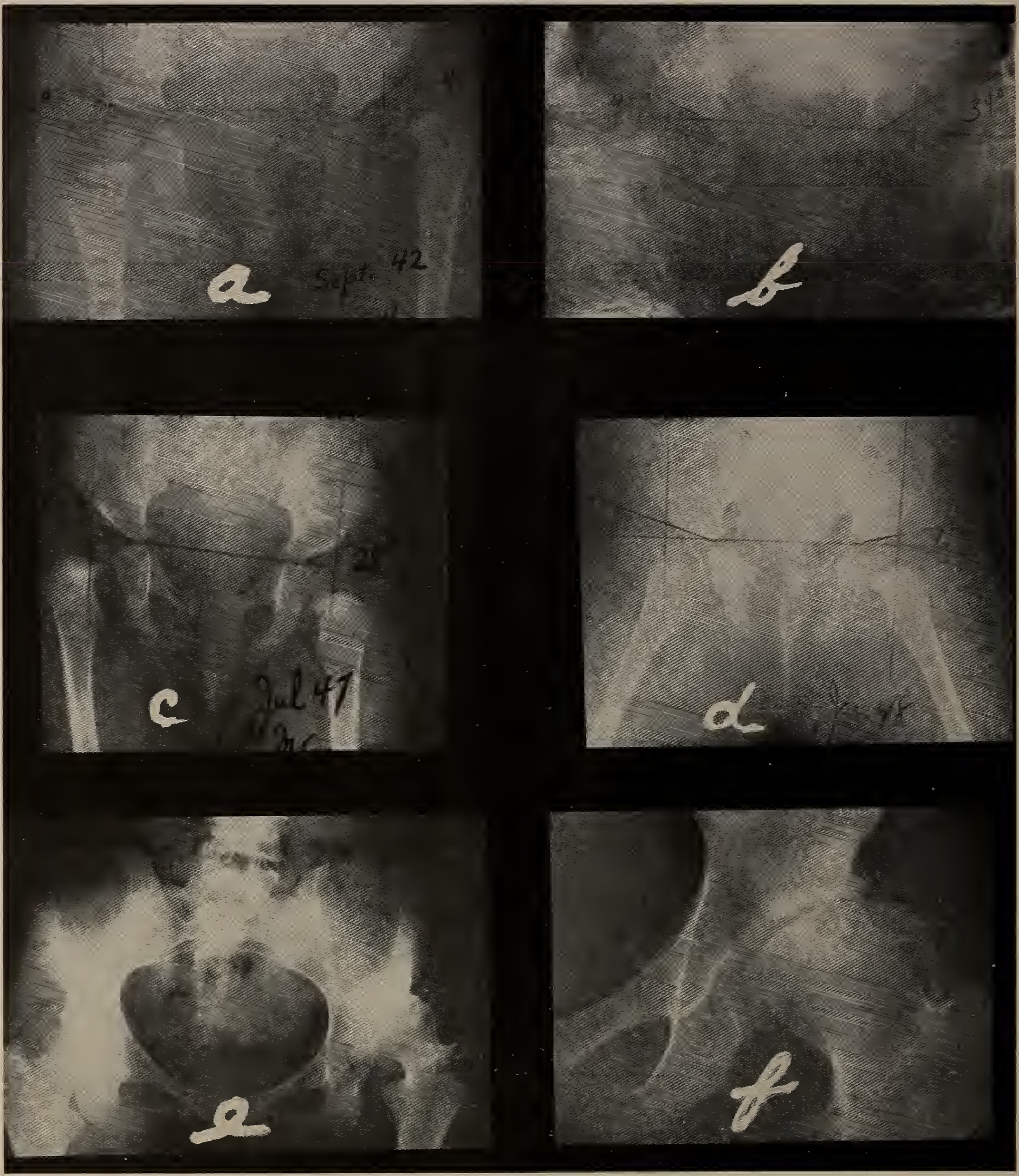

Figure 2.—(a) The acetabulum on the right measures 22°. The head lies in normal relation. The left acetabulum measures 41°. The head lies in the upper outer quadrant. Stage of congenital dislocation.

(b) Two months after treatment. The acetabulum on the right measures 21°. The acetabulum on the left measures 34°. The heads of both femora lie in the acetabula. Both femora have been abducted and internally rotated.

(c) The acetabulum on the right measures 34°. The epiphysis for the right femur lies in the outer inferior quadrant. The left measures 28°. The epiphysis for the head lies in the inferior inner quadrant.

(d) Six months after treatment. The heads of both femora are in normal position, lying in the inferior inner quadrant. The epiphysis for the right is delayed in relation to the left. The acetabulum on the right has reduced from 34° to 18° and the left from 28° to 15°.

(e) Shallow acetabulum on the left side with sclerosis of the acetabulum and the head of the femur showing traumatic arthritic changes.

(f) Shallow acetabulum with cystic changes in the head of the femur indicating early arthritic changes.

widening of the epiphyseal line, decalcification, and irregularity in density of the juxta-epiphyseal strip of the femoral neck (Figure 3c). Often there is history of trauma, usually of a trivial nature. It is noted, however, that the head retains a normal position in the acetabulum and becomes displaced backward on the neck, the epiphysis being rotated posteriorly (Figure 3d). There is a gradual ascent of the femoral neck in the acetabulum (Figure 3e). Unless reduced, the malformation will lead to degenerative

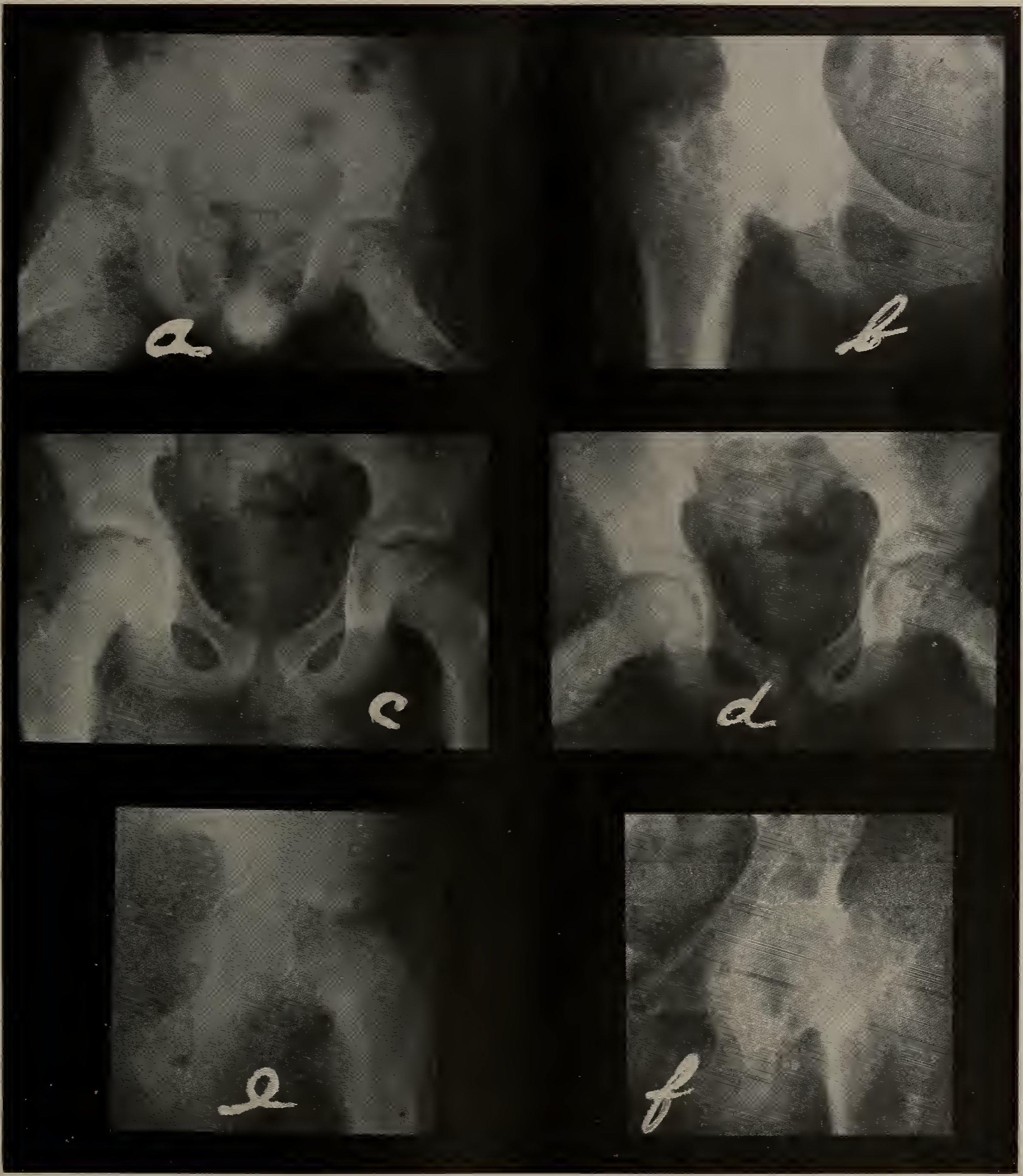

Figure 3.—(a) Early Perthes' disease. Broadening of the diaphyseal line. Destructive areas in the head as result of an aseptic necrosis.

(b) Old healed Perthes' disease with subsequent traumatic arthritis.

(c) Slipped epiphysis—early stage. Widening of the diaphyseal line of the right hip with slight rarefaction of the diaphyseal end of the neck.

(d) Slipped epiphysis—early stage. Lateral view shows an inward and slight backward rotation of the head of the femur.

(e) Old slipped epiphysis with an inward rotation of the head, widening of the diaphyseal line, and a broadening of the neck, resulting in a coxa vara deformity.

(f) Old slipped epiphysis with resultant traumatic arthritis.

arthritis of the hip joint (Figure 3f). Such a joint usually becomes painful and functionally useless by the time the individual reaches middle age, whereas in dysplasia symptoms may not start until middle age. It is noted that both in Perthes' disease and in slipped epiphysis the depth of the acetabulum may be normal, and that there is a history of the disease starting in childhood.

COMMENT

Because it can be corrected in early life, dysplasia of the hip is a challenge to the pediatrician to discover the lesion early and so institute preventive treatment; to the radiologist who must acquaint himself with this syndrome; to the orthopedist to treat properly the infants who have the disease and so establish a normal hip socket; to the general practitioner who must recognize in the young adult a dysplastic hip and so advise the patient to take an occupation which will subject the hip to minimal trauma in the hope of preventing arthritis later.

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Clinical Application of Electrokymography

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SUMMARY

The electrokymograph may be used in getting information to augment clinical manifestations of abnormalities of cardiac motion. It is adaptable to the study of other activities in the body such as respiration and the movement of masses.

In electrokymographic examination of four patients with constrictive pericarditis with calcifications, the authors noted a distinctive wave pattern common to all. Similar waves were obtained from localized areas in three patients with suspected constrictive pericarditis.

Differences between the waves produced by pulsatile aneurysms and those of non-pulsatile masses adjacent to the cardiac silhouette were noted in experimental studies.

Until recently, the best known methods of obtaining records of the motion of the heart with the thorax intact have been roentgencinematography[3] and roentgenkymography.[10, 14] In 1945, Henny and Boone[8, 9] introduced a third roentgen method, electrokymography.

The electrokymograph is an instrument designed to detect and record variations in the intensity of a small beam of x-rays. It consists of a photoelectric tube with fluorescent material covering the photosensitive side (this combination being called the "pick-up unit"), an electrocardiographic apparatus as a recording device, and a fluoroscope. The photoelectric tube is activated by x-rays falling on the fluorescent material, and the resulting electrical current is led to the electrocardiographic apparatus. Variations in the intensity of the x-rays are translated into variations in electrical current, and recorded as a line on photographic paper which is marked with lines indicating time intervals. An increased flow of current, due to increase in the intensity of the x-rays reaching the fluorescent material, causes the line being traced on the paper to be directed downward; a decrease in current causes the line to be directed upward.

The pick-up unit is mounted between the patient and the fluoroscopic screen. Using the fluoroscopic screen, the unit is positioned so that the center of its fluorescent surface is opposite the border of the heart. When the heart border moves laterally, as it does in diastole, more of the heart lies between the sensitive surface and the x-ray tube, reducing the intensity of the x-rays reaching this surface. This causes the line being traced on the photographic paper to move upward. Conversely, in systole, with less of the heart between the sensitive surface and the x-ray tube, the line moves downward.

When the pick-up unit is directly over the heart, rather than opposite a border of the heart, all of the x-rays of the primary beam which reach the sensitive surface pass through the heart. The fluctuations in x-ray intensity recorded are due to variations in thickness of the heart during the cardiac cycle. The heart is thickest in diastole, hence the intensity of the x-rays reaching the pick-up unit during diastole is less than during systole. Tracings obtained in this manner are called "density tracings." They closely resemble the tracings obtained from the heart border; during systole the line moves downward, and during diastole it moves upward.

To permit identification of the phases of the cardiac cycle on the electrokymogram, the carotid pulse is simultaneously recorded on the same photographic paper, using a pressure capsule fastened over the carotid artery on the patient's neck.

NORMAL CURVES

Adequate descriptions of normal electrokymograms of the heart and great vessels may be found in the literature.[1, 2] Hence, the authors have included only a resume of the general appearance of the normal curves. Examples are shown in Figure 2.*

As will be recalled, cardiac systole extends from the time of closure of the auriculoventricular valves to the closure of the semilunar valves (aortic and pulmonic). Systole has two principal phases: (1) isometric contraction, during which the ventricle is a closed chamber in which the pressure rapidly rises; (2) systolic ejection, beginning when the semilunar valves are forced open because the intraventricular pressure exceeds the pressure in the aorta and the pulmonary artery, and ending with the closure of the semilunar valves. Diastole also has two principal phases: (1) isometric relaxation, in which the ventricle is again a closed chamber; and (2) the

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*This presentation is arranged so that references to the literature will be incorporated with each condition described. The sections on constrictive pericarditis, intrathoracic masses, and in part the section on paradoxical motion represent original reports. The remaining sections cover material studied by the authors but also reported previously in the literature. It will become obvious to the reader that complete detail concerning each of the conditions can not be reported in this paper.

filling period, beginning with the opening of the auriculoventricular valves, and continuing to the closure of the auriculoventricular valves.

The carotid pulse tracing provides two landmarks for identifying the phases of the cardiac cycle in the electrokymograph. The foot of the major ascending limb of the carotid pulse marks the beginning of the systolic ejection phase. The tip of the dicrotic notch on the descending limb indicates the closure of the semilunar valves, since it is produced by the impact against the valves of blood moving toward the ventricle.

The onset of systolic ejection is recorded instantaneously on the photographic paper, since the mechanism for this is entirely electrical. In recording the carotid pulse, however, it takes approximately 0.02 second for pulse waves to travel from the level of the aortic valve to the carotid artery, and 0.01 second for its transmission from the pressure capsule over the carotid artery to the recording device. One must measure back, therefore, from the foot of the major ascending limb of the carotid pulse, a distance corresponding to 0.03 second, to find the point on the heart tracing at which systolic ejection begins.

Through the use of the carotid pulse, the onset of systolic ejection can be identified on the ventricular electrokymograph. Systolic ejection is usually recorded as a short upward movement of the tracing followed by a steep downward movement, indicating a brief lateral movement followed by a greater medial movement of the ventricle. The end of systolic ejection and the onset of the isometric relaxation phase of diastole are identified by the dicrotic notch on the carotid tracing, the same time correction used for systolic ejection being necessary.

Within approximately 0.1 second after the beginning of isometric relaxation, as determined from the dicrotic notch, the electrokymograph is seen to ascend rapidly at first, and then more slowly as it reaches the full height of the curve. The initial rapid ascent is due to lateral movement of the ventricle wall as the ventricle fills rapidly after the opening of the auriculoventricular valves. The slow ascent corresponds to slower filling after the initial rapid emptying of the auricle. At or near the top of the electrokymographic curve, diastole usually ends abruptly. A short descending line follows, representing the period of isometric contraction. It ends at the point which marks the onset of systolic ejection, completing the cycle.

The short waves produced as the result of isometric relaxation and contraction frequently are referred to as secondary waves superimposed on the large fundamental waves associated with ventricular filling and emptying. These are due to rotation and change in shape of the heart, especially noticeable during the isometric periods.[1, 2]

The commonest auricular electrokymogram consists of two waves: the first peak occurring at the onset of the major ascending limb of the carotid and the second peak at or just following the carotid dicrotic notch. The ascending limb of the first peak corresponds to ventricular filling and isometric contraction; the descending limb represents motion of the auricle towards the midline due to ventricular contraction. The ascending limb of the second peak begins at or near the crest of the carotid pulse wave and represents the filling of the auricle which pushes its borders laterally, overcoming the medial pull of the ventricle; the descending limb begins at or very shortly after the closure of the semilunar valves and is related to isometric relaxation and possibly to early ventricular filling. Less commonly but certainly not infrequently, three waves are seen in the auricular electrokymogram. The two basic waves described above are present; the third one consists of a short downward movement on the ascending limb of the first wave. This is associated with auricular systole.

Graphs of the aorta and pulmonary artery are similar in configuration to pressure and volume tracings obtained by direct methods. Both the aorta and pulmonary artery produce waves paralleling the carotid pulse wave, with time differences corresponding to their distance from the ventricles.

In order to illustrate the potentialities of this instrument in fields other than the cardiovascular system, electrokymograms of diaphragmatic motion and pulsation in the lung fields have been included in Figure 1.

Electrokymograms from the cardiac silhouettes of individuals with apparently normal cardiovascular systems vary considerably in their detail; however, there is a remarkable constancy in their fundamental configuration and time relationships within relatively narrow limits. Even though the "normal" pattern may vary from individual to individual, and variation can be detected between records obtained at different points on the same chamber of the same individual, the normal electrokymograms contrast quite sharply with records obtained from clinically abnormal hearts. While it is not within the scope of this presentation to cover the entire field of cardiac abnormalities, a few of the more common abnormalities are briefly presented:

Ventricular Asynchronism. In 1946 and 1947 Ellinger, Gillick and Boone[4] studied the time relationships of motion of the right and left ventricles with those of the ascending aorta and pulmonary artery, and compared these relationships with the carotid pulse wave. In this study it was shown that, to establish the time relationship of the ejections of the right and left ventricles, it is sufficient to measure the time relationship between the onsets of the major ascending limbs of the carotid pulse wave and of the pulmonary artery electrokymograph. These observers found that ejection from the two ventricles does not always occur simultaneously in the so-called normal individual and that the limits of asynchronous ejection in the normal was plus or minus 0.03 second. Asynchronous ejection in excess of 0.03 second is almost always accompanied by electrocardiographic evidence of bundle-branch block.

Figure 2(f) shows an example of asynchronism of ejection with the left ventricle leading. It will be noted in this figure that the pulmonary artery follows the carotid pulse tracing. The electrocardiogram in this individual showed a right bundle-branch block. By comparison, illustration (c) of this same figure shows the normal relationship of pulmonary artery electrokymograph to carotid pulse tracing; here the carotid follows the pulmonary artery by approximately 0.02 second.

Katz,[12] and Wolferth and Margolies[19] have reported studies which substantiate the electrokymographic findings noted here.

Abnormal Rhythm. Although several methods exist for the determination of the various arrhythmias, it is felt that additional information may be obtained concerning the mechanics of cardiac motion and thus indirectly the quality of myocardial contraction through the study of the arrhythmias.

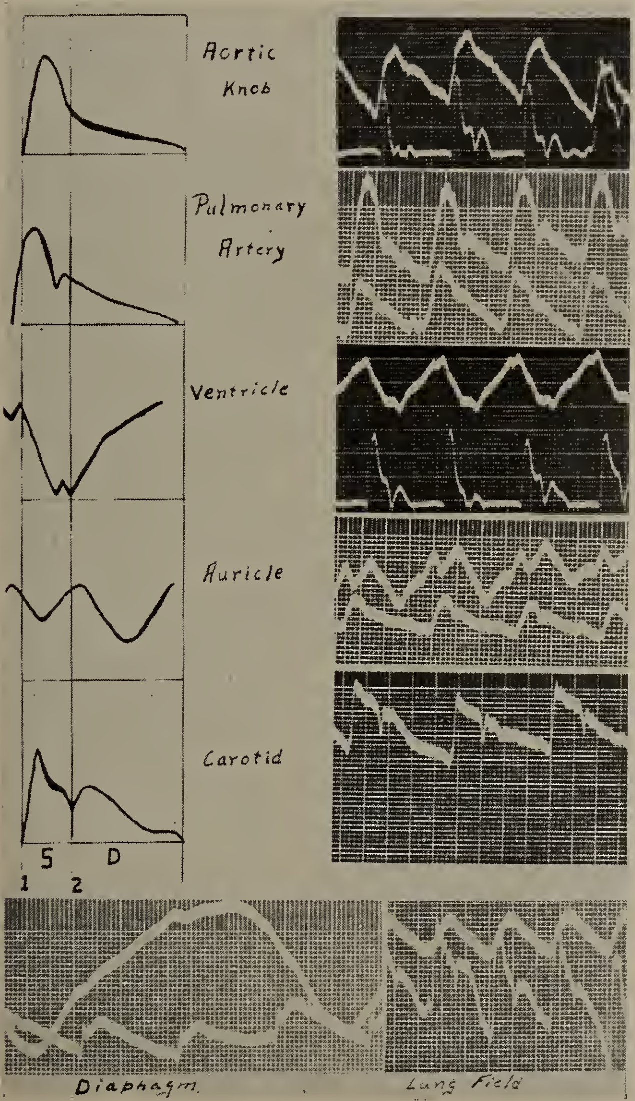

Figure 1.—Schematic and actual records from selected areas of the cardiac silhouette of normal individuals. Ventricular record of the mid-left ventricular border on a postero-anterior projection; auricular record of the mid-right border of the cardiac silhouette on a postero-anterior projection. Right dome of diaphragm. Lung field was from the fourth intercostal space (anteriorly) at the mid-clavicular line. S=systole; D=diastole; 1 marks onset of major ascending limb of carotid; 2 marks tip of dicrotic notch. (Pulse tracing of carotid artery is below electrokymograph.)

Figure 2(a, b, c, e, and f) shows examples of several of the more common types of abnormalities associated with rhythm.

Paradoxical Motion. Paradoxical motion of an ischemic area of myocardium has been the subject of several publications. Tennant and Wiggers[17] in 1935 produced coronary occlusion in localized areas of a dog's heart and by means of direct myographs demonstrated paradoxical motion in the area. Hirsch,[11] Faber and Kjoergaard,[5] Gubner and Crawford,[7] Sussman, Dack and Master,[16] Thomas and Garland,[18] and others, have repeatedly demonstrated by means of the roentgenkymograph a reversal of motion in certain areas of the ventricular wall in

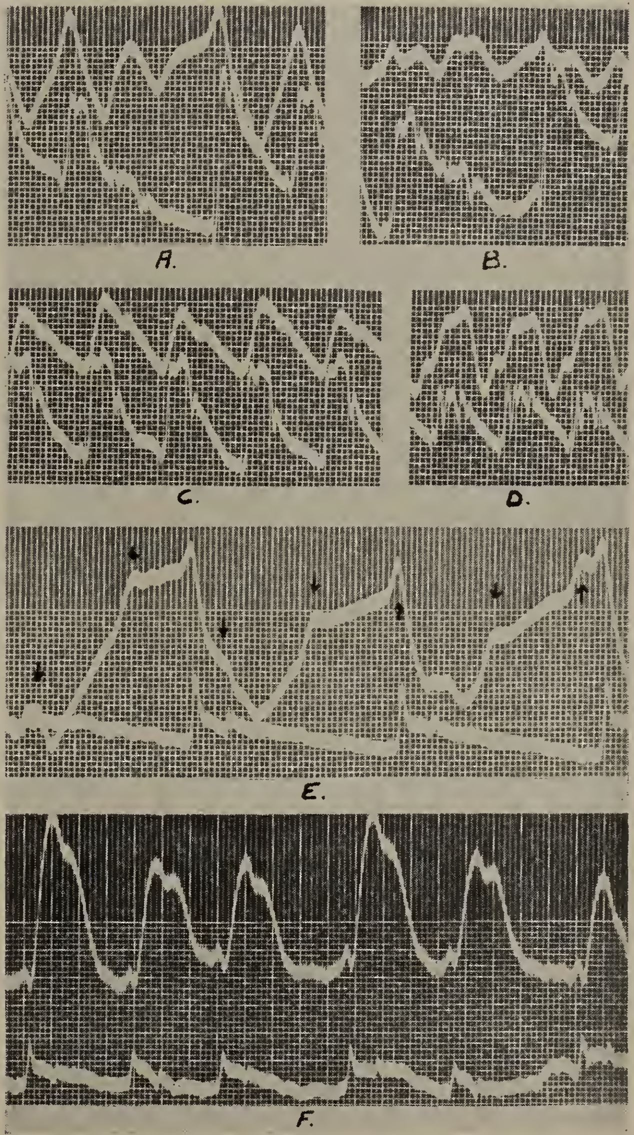

Figure 2.—Selected abnormalities: (a) ectopic beat, at the left ventricular border; (b) ectopic beat, at the right auricular border; (c) alternans as shown on the pulmonary artery; (d) paradoxical motion of the left ventricle in a patient with hypertension and symptoms of coronary insufficiency; (e) complete A-V dissociation as obtained at the mid-left ventricular border (auricular waves indicated by arrows); (f) electrokymogram of pulmonary artery illustrating both auricular fibrillation and delayed right ventricular ejection—carotid precedes the pulmonary artery by .04+ second. (An electrocardiograph tracing showed a right bundle-branch block.) (Pulse tracing of carotid artery is below electrokymograph.)

individuals in whom clinical evidence of extensive myocardial infarction had been noted. Recently, Murray[13] reported similar observations on the hearts of dogs. Electrokymographic examination of individuals who have given definite clinical evidence of extensive myocardial infarction have revealed abnormal motion in areas of the ventricular border, and in some instances the curves obtained closely resemble those reported by Tennant and Wiggers.[17] Figure 2(d) shows an example of paradoxical ventricular motion.

It is of interest to note that occasionally similar curves have been obtained in individuals with cardiac complaints but no definite electrocardiographic evidence to support a diagnosis of infarction or severe myocardial ischemia.

Constrictive Pericarditis. Electrokymographic examination of four patients with radiologically and surgically proven constrictive pericarditis with calcification has produced a constant type of ventricular curve. The ventricular wave has the appearance of a "square wave"—that is, its top is flat and it is practically devoid of secondary waves. The descending or emptying component of the wave has about the same duration and angle as the ascending or filling limb. The over-all appearance of several cycles is that of a straight line with V-like interruptions constituting the emptying and filling components. Figure 3 illustrates ventricular electrokymograms obtained from three of these individuals.

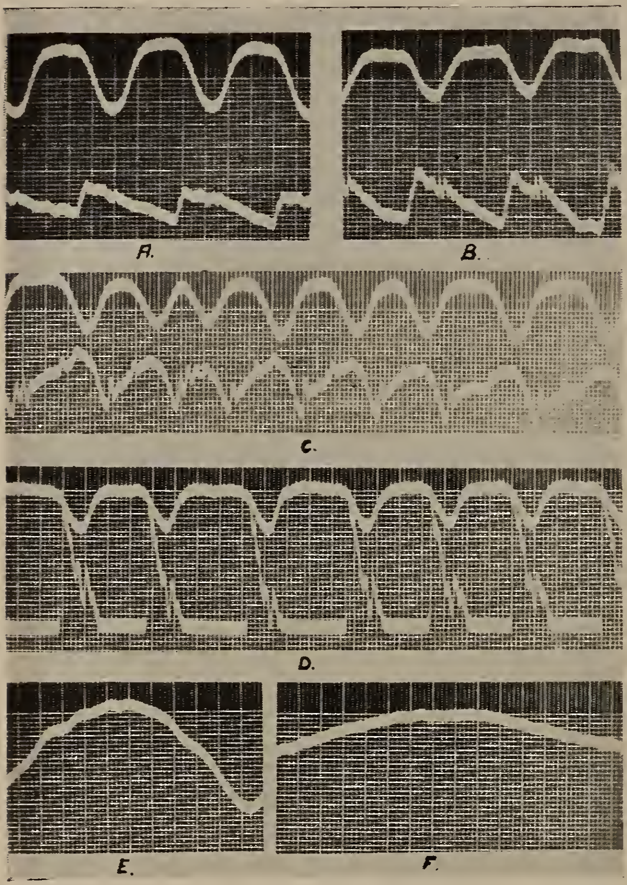

Figure 3.—Square waves obtained from the cardiac silhouette of three patients with clinical and radiologic evidence of constrictive pericarditis proved by operation. (a) and (b) are left and right ventricular electrokymograms respectively, from the same patient; (c) mid-left ventricular border—also shows auricular fibrillation; (d) mid-left ventricular border in a patient operated upon for constrictive pericarditis in 1937 with recurring evidence of constriction and operative intervention in 1948; (e) and (f), electrokymograms of a balloon; (e) represents free motion; (f) represents restricted motion of the same balloon due to cardboard collar. (Pulse tracing of carotid artery is below electrokymograph.)

It is of interest to note that similar waves have been obtained from localized areas in three subjects with suspected constrictive pericarditis.

A similar type of wave can be reproduced by placing a water-filled balloon inside a container which limits the filling of the balloon but does not interfere with its emptying. Figure 3 illustrates an electrokymogram of such a balloon.

Intrathoracic Masses. The differential diagnosis of abnormal shadows in the area of the cardiac silhouette has been most perplexing. The roentgenkymographic approach has been marked by encouragements and disappointments.[6, 15] The authors approached this problem by setting up a crude model simulating a vessel with an aneurysm and a heart with a spherical tumor adjacent to it. Both "vessel" and "heart" were supplied with sufficient expansile force so that motion would be applied to both the "aneurysm" and the "tumor." Density and border electrokymographic studies were made.

As may be seen in Figure 4, the experimental "aneurysm" was found to expand synchronously with the "vessel" in all border and density positions.

Figure 5 diagrammatically shows the experimental "tumor" or "mass" and the points at which it was studied for border and density changes. Motion was imparted to the mass by motion of the "heart." Unlike the expansile "aneurysm," the slit (photosensitive surface) of the electrokymograph was covered to a greater extent along the distant border

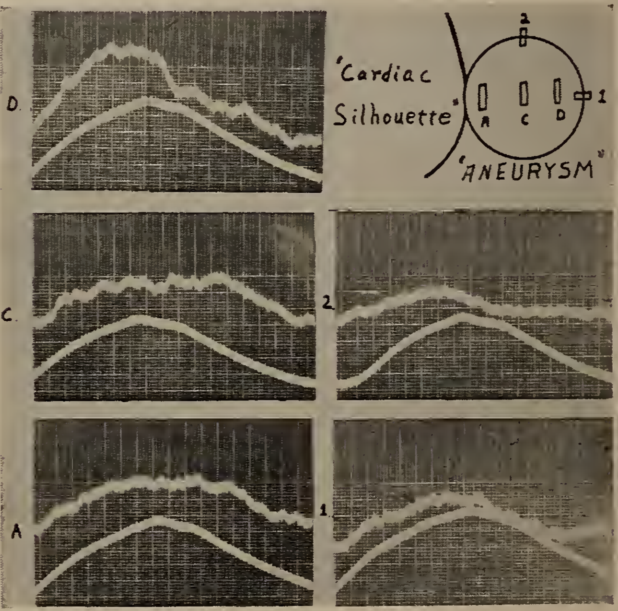

Figure 4.—Experimental "aneurysm" showing direction of motion at areas indicated on diagram. The upper curve is the electrokymograph of the "aneurysm"; the lower curve represents the direction of motion of the moving force (heart or great vessel).

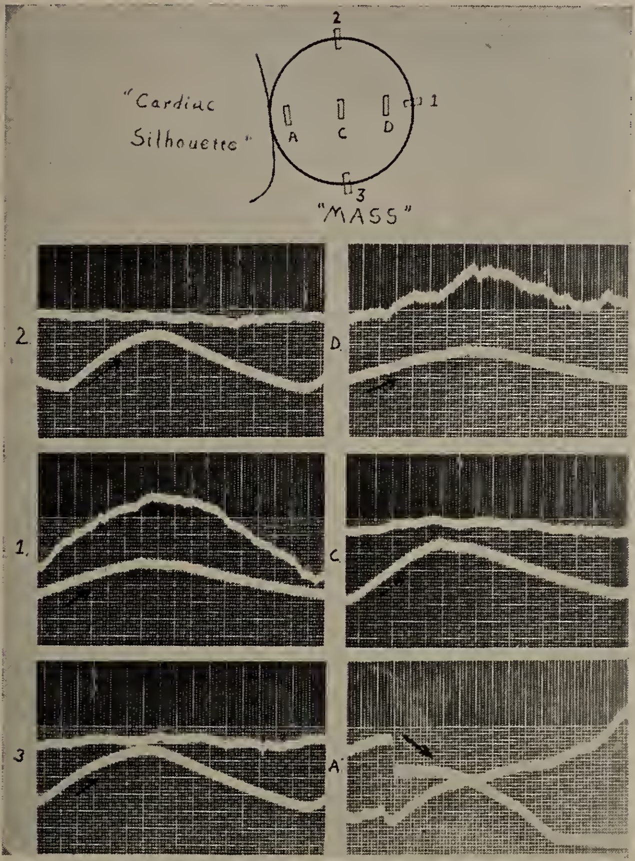

Figure 5.—Experimental "mass" adjacent to the cardiac silhouette. "Cardiac silhouette" represents the portion of the heart or great vessels transmitting motion to the mass. Positions D and 1 show the electrokymographic curve and the curve from the moving force—both move in the same direction; position A shows the two motions going in opposite directions; other positions show no or only indefinite electrokymographic motion. (Arrows are drawn to and in direction of the tracing from the moving force which represents either the heart or great vessels.)

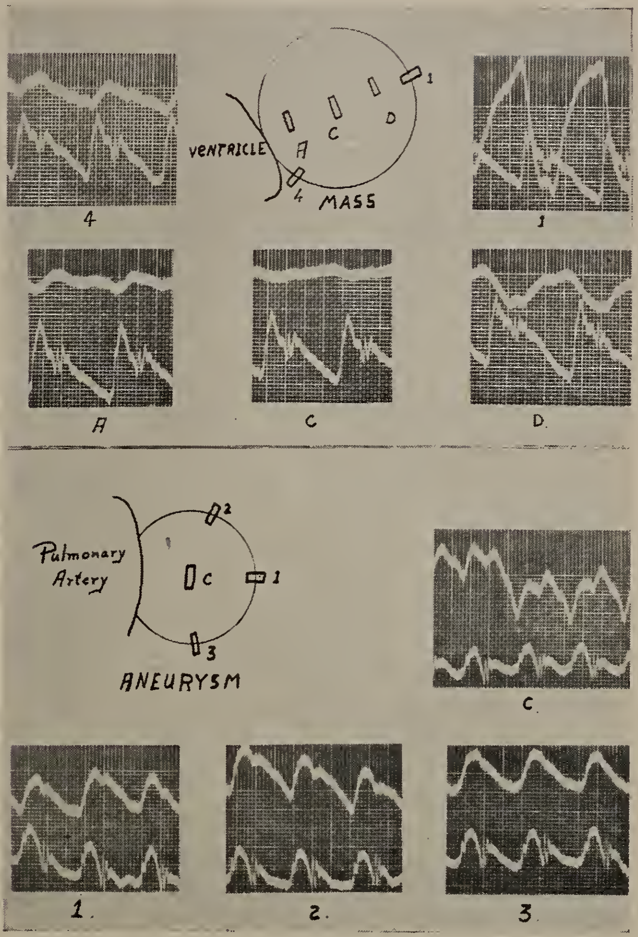

Figure 6.—Actual electrokymograms taken from a dermoid cyst (proved by operation) adjacent to the left ventricle and from an obvious aneurysm of the pulmonary artery. Numbers indicate areas from which corresponding records were obtained. (Pulse tracing of carotid artery is below electrokymograph.)

while the adjacent border was uncovered, thus producing waves in opposite directions. Electrokymograms from borders parallel to the line of motion showed little or no change. Density changes at the center of the "mass" during motion were of such small magnitude as to produce little or no electrokymographic change; as the slit was moved from the center toward the periphery along the line of motion, the changes were more marked. Density changes adjacent to the "heart" produced waves opposite in direction to the heart motion while in the distant periphery the changes were in the same direction as the "heart." The rationale for these observations will be made in a separate report.

Similar observations were made on selected patients with known tumors or aneurysms, and the results were found to be consistent. An example of each is shown in Figure 6.

It must be emphasized that this is a brief summary of the electrokymograph and its uses and that the discussions of constrictive pericarditis and the differentiation of aneurysms and intrathoracic masses are preliminary reports. The study of these conditions is still in progress. Nevertheless, an appraisal of the electrokymograph at its present stage of development is desirable.

It represents a valuable extension of the fluoroscopic technique, providing a permanent record of the movements seen in fluoroscopy, available for study after the examination has been completed, for restudy, and for comparison with subsequent examinations of the same patients. In effect, it is a fluoroscopic "microscope," demonstrating movements too small in amplitude, or too short in duration, for the unaided eye to perceive. It permits correlation in time of movements occurring in separate parts of an organ, too far apart for the eye to correlate accurately, or of movement seen with the patient in two or more different positions.

A comparison of the electrokymograph with the roentgenkymograph as to the advantage and disadvantages of each would seem appropriate. At present it appears that the former has at least the following advantages: the movements as recorded are amplified so that smaller movements are brought out and larger ones are more easily studied; a larger number of cycles can be recorded; areas to be studied can be selected fluoroscopically, in their optimum projections; the slit can be aligned in the direction of the motion of the part; correlations in time of movements of various parts of an organ are more accurate.

There are, on the other hand, these disadvantages: Measurement of true amplitude of movements is not as yet possible with the electrokymograph; the precise point along the border of the part at which the movement is recorded is not shown as it is on the roentgenkymogram (this problem, however, can be remedied by the use of a spot film device in conjunction with the electrokymograph); more cooperation on the part of the patient is required; the procedure is more time-consuming; it is necessary that there be in the fluoroscopic room a technician trained in the use of the apparatus, although this training can be very quickly acquired. A most important disadvantage is the greater possibility of overexposure of the patient to radiation.

It may be that the electrokymograph will be used much as the "spot film" is used in gastro-intestinal work—it can be immediately brought into play to secure for the record a phenomenon which the fluoroscopist has seen on the screen, or to enable him to study at his leisure a movement he does not understand, with the assurance that this particular movement, at this particular point, will be recorded for him. The roentgenkymograph, like the large gastro-intestinal film made in the radiographic room, will provide him with an over-all view of the motion of the part, and may indicate which areas require further and more detailed studies.

Should a choice between the roentgenkymograph and the electrokymograph be necessary, the authors are of the opinion that the electrokymograph, due to its greater flexibility in use and clarity of graphic records, would be the more valuable instrument from both the clinical and research points of view.

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Discussion by S. F. Thomas, M.D., *Palo Alto*

It is rarely these days that modern medicine produces something which is almost entirely new. The electrokymograph is a modification of the use of the fluoroscope and in the terms of Drs. Gillick and Reynolds, it is a "fluoroscopic 'microscope.'" As usual, with most electronic gadgets and most mechanical improvements in medicine, the method is more complicated than anything that preceded it, but it has many advantages which balance most of the difficulties.

It is not easy to pick up even the rationale of some of their discussion. However, with considerable time and just a little use of the instrument, one quickly becomes acquainted with the excursions and while roentgenkymography offers a slightly confusing background, it does give one some notion as to the movements that are being recorded.

Roentgenkymography and electrokymography could probably be found to supplement one another, but undoubtedly the electrokymograph is a finer instrument than the roentgenkymograph, and if eventually some way of calibrating the electrokymograph is found, the mechanical advantages of the roentgenkymograph will disappear.

The uses of the electrokymograph are found in the arrhythmias, and some of the finer points of cardiophysiology have already been explained by the electrokymograph which could be explained in no other manner.

In this day of ever-increasing death rate from degenerative diseases, insults to the myocardium are more and more frequent; it is my belief that some of the insults (silent occlusions and/or ischemias) to the myocardium cannot be recorded with the usual electrocardiograph, and a mechanical means of some sort of recording cardiac movements will be found helpful in prognosticating the significance of some chest pain and debatable electrocardiographic findings. The roentgenkymograph acts to corroborate the electrocardiograph and close some of the loopholes in electrocardiography. The electrokymograph, being of still finer sieve, will undoubtedly close still further some of the gaps in the screen of the usual electrocardiogram or roentgenkymograms. Drs. Gillick and Reynolds are most conservative and have claimed but little for the electrokymogram along these lines.

The most striking advancement with the electrokymograph is the differential of aneurysm vs. solid tumor in the chest where it is often desirable to differentiate between pulsating and non-pulsating masses. This should prove very valuable and the experimental results obtained so far, which are more than preliminary in nature, are most encouraging.

The Papanicolaou-Traut Method of Cancer Diagnosis

Its Use as a Routine Pathologic Laboratory Procedure

STUART LINDSAY, M.D., *San Francisco*

SUMMARY

In a series of 450 examinations by the smear technique in the pathologic laboratory of a small private hospital, the total diagnostic error on all smears was 6.6 per cent. The error on vaginal smears was 4.7 per cent. These figures include false positives, false negatives, and all those smears classified as suspicious even though positive or negative diagnoses were made on subsequent examinations.

The Papanicolaou-Traut method of cancer diagnosis can easily be made one of the routine pathologic procedures in the small hospital laboratory. Technicians with little previous cytologic experience can be trained to screen vaginal and other smears accurately after a short training period. This cytologic method is proving to be of value in the early detection of some neoplasms, and if its application is to be extended, the practicing pathologist should add the test to his diagnostic routine.

IT IS generally agreed that further reduction in the mortality from malignant disease depends at present largely upon early diagnosis. The careful study of Papanicolaou and Traut[5] on the cytologic diagnosis of uterine cancer has initiated the use of a diagnostic method by which early malignant processes may be detected. In addition, it has the advantage that repeated examinations may be made without the disadvantages of minor surgical procedures. Knowledge of this technique has been extended by the reports of Meigs and his co-workers,[4] Jones,[3] Ayre[1] and others. Gates and Warren[2] recently presented an extensive appraisal of the method. At present there seems to be increasing enthusiasm for and acceptance of this method of diagnosis as a screening procedure and as an adjunct to other diagnostic tests in selected cases of malignant disease.

In general, pathologists have not shared in this enthusiasm, and to date few pathologists have used and evaluated the method. Since there is no fundamental difference between observation of malignant cells in sections of tissue and in smear preparations, and since pathologists often use cellular criteria alone in the microscopic diagnosis of malignancy in tissue sections, this diagnostic adjunct would seem to belong within the field of pathology. Certainly, pathologists should be able to learn this cytologic method of diagnosis more quickly and easily than those less familiar with cytologic and histologic details. Furthermore, if the use of the method is to be extended to screen significant numbers of the population in the cancer age group, the possibility that pathologists and their laboratory assistants could assume part of this task should be considered.

With few exceptions,[6] the recorded experience with this method has been in the laboratories of teaching centers and large cancer clinics, where research and the training of physicians and technicians have been a large part of the cytologic program. The reporting of experience and evaluation from smaller hospital laboratories seems warranted, since, as the method becomes more widely used, these large teaching centers obviously cannot continue to cope with the problem as a routine diagnostic test.

It is the purpose of this presentation to report on the use of the Papanicolaou-Traut method of cytologic diagnosis as a routine procedure in the pathologic laboratory of a small private hospital. This diagnostic method as applied to vaginal and other fluids appears to be entirely feasible in the small laboratory in a small community. In a period of seven months a number of unsuspected neoplasms were discovered. A total of 450 examinations were made (approximately 900 smears) on 419 patients.

The laboratory concerned in this report is in a private hospital which has 139 beds and which had 43,938 patient-days in 1947. The laboratory employed 11 technicians and performed a total of 32,108 laboratory procedures in 1947. There were 2,119 surgical specimens examined and 85 autopsies performed in 1947. Approximately 50 per cent of the clinical-pathological procedures were done on out-patients. The hospital serves as the medical center of a suburban county of 207,000 people and is situated in a town with a population of 34,000. There are 135 physicians in the county, and the majority are on the hospital staff. Some of the vaginal smears were submitted for study by six gynecologists, but many were contributed by general practitioners, internists and others. The staining and screening were done in the pathologic section of the laboratory by a licensed technician.

During the period from October 15, 1947 to May 15, 1948, this method was made available to the physicians of the community without a charge being made to the patient. The availability of the method was made known to the physicians in the hospital staff bulletin. No charge was made initially for two reasons: (1) It was believed that if physicians were able to obtain smears on many of their patients

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either as a screening or diagnostic procedure, they would be able to evaluate the test in relation to their own practices, and (2) it was felt that further experience with a volume of material by both the technician and the pathologist was desirable before a fee was charged for the examination. It has been agreed that this cytologic test is a screening procedure or a diagnostic adjunct, that it does not replace the biopsy as a means of diagnosis (except in rare instances) and that it should be interpreted in the light of the clinical findings as are the results of other laboratory procedures.

Once the test has been established as a routine procedure, a charge to private patients should be made. The overhead costs can be calculated easily. The fee should be low enough to encourage use of this diagnostic method.

Many of the vaginal smears were taken by physicians as part of a routine physical or pelvic examination on well patients. Some were taken from patients with symptoms presenting diagnostic or prognostic problems. A few were requested by the pathologist on cases of proven pelvic, urinary or suspected pulmonary carcinoma in order to obtain positive smears for study. Several smears from patients with radiated cervical carcinoma were examined. During the seven-month period, all gastric fluids containing no free hydrochloric acid on chemical analysis were examined for malignant cells. The majority of specimens were from out-patients; a few were sent to the laboratory from the county hospital for indigents in the same community. Surgical pathological findings from these patients having cytologic tests were readily available for correlation.

Labeled bottles with tight screw-caps, partially filled with 95 per cent alcohol-ether fixative, are available in the laboratory where they may be obtained by physicians or their office nurses. A supply of mimeographed requisition forms and instruction sheets are given to the physicians with the bottles of fixative. The requisition forms include spaces for pertinent data which may be helpful in interpreting the smears, and the instruction sheets give in detail the steps in obtaining and fixing the smear preparations. These forms are patterned closely after those described by Papanicolaou and Traut.[5] When sputum, urine, ascitic fluid or gastric fluid is to be examined, it is taken to the laboratory and the smears made in an appropriate manner by the technician. Better preparations have been obtained from fresh material than from these miscellaneous fluids received in equivalent amounts of 70 per cent or 90 per cent alcohol. At least two smears are made from the sediment of these fluids. It is requested that two smears be made on vaginal fluid examinations. A significant number of vaginal smears received are unsatisfactory because of scantiness or distortion due to drying. In these instances, the report includes a request that the test be repeated. Some physicians have obtained excellent smear preparations by dispensing with the aspirating tube. They collect the vaginal fluid in the posterior half of the vaginal speculum, and make thin smears with the gloved finger.

The staining technique used is that of Papanicolaou and Traut[5] in preference to the use of hematoxylin and eosin or other counterstains. With the former stain, the excellent nuclear and cytoplasmic detail and the translucent quality make the contrast between normal and abnormal cells more striking than with other staining procedures. Excellent Kodachrome photomicrographs can be made from these smears. Satisfactory stains can be done by inexperienced technicians simply by following the prescribed steps of the staining method. With an average of only four smears received per day, it seems reasonable to stain them only once or twice a week, unless a report is urgently requested. Large staining jars are used for all solutions, and it has been found necessary to discard and replace the staining solutions only at intervals of one to two months.

Widespread use of this diagnostic method depends on the availability of technicians trained to examine the entire slide and mark atypical, suspicious or malignant cells. With only an occasional smear to examine, a pathologist could do the entire examination. However, with a larger number of slides to examine, the average pathologist in a busy laboratory does not have the time required for detailed microscopic searching. In this laboratory the technician was on a 40-hour week and spent approximately half the day preparing tissue sections and the remainder of the day staining, screening and typing reports on the vaginal and other smear preparations. She was able to learn the fundamentals of screening during an informal training period of two weeks in Traut's cytologic laboratory at the University of California Medical School. Even in this short period she became adept in screening the slides and marking any atypical, suspicious or malignant cells for later review and decision by the directing pathologist. With continuing experience, her proficiency is of course increasing. At present, the average single smear can be screened accurately and abnormal cells marked in approximately ten minutes.

In this laboratory, all slides including those reported as "negative" by the technician, are examined by the pathologist, since an occasional significant finding may not be noted by the first observer. It is the pathologist's responsibility to identify the abnormal cells present, and to classify them as "suspicious" or "positive" for malignancy. Obviously this responsibility should not rest with the technician. It is to be regretted that already demands from physicians and patients for the test have led to its performance by technicians and technologists, without supervision, in commercial laboratories. This is a dangerous situation, since these unqualified individuals then are attempting to diagnose malignant disease.

METHOD OF REPORTING RESULTS

Instead of Papanicolaou's method of reporting the cytologic findings as Class I, II, III, IV, V, in this laboratory the terms "negative," "suspicious" or "positive" are used. That a single negative vaginal smear is not conclusive evidence of the absence of uterine malignancy has been repeatedly stressed to physicians submitting smears. If suspicious symptoms or lesions are evident, the test obviously should be repeated.

On vaginal smears in women past the menopause, atypical (though not frankly suspicious or malignant) basal cells are occasionally encountered. At times, individual cells of this group are almost indistinguishable from malignant elements. In these instances the presence of atypical cells is reported and, following the suggestion of Meigs and his coworkers,[4] a request is made that the patient be given stilbestrol for seven to ten days followed by another smear. Within this period, the cellular pattern becomes largely squamous in type, and the atypical cells disappear. Malignant cells, if present, are not altered by this therapy and are then more easily distinguished from the surrounding squamous elements.

Another source of possible error lies in distinguishing between the cells of hyperplastic endometrium and those of a well-differentiated fundal adenocarcinoma, since there is no sharp line of distinction between them.

Smears are reported as "suspicious" if (a) any cells present show some but not all of the criteria of malignancy, or (b) only a single or small number of definite malignant cells are present. Repeated smears are requested and taken at intervals, and examined until a positive or negative decision can be reached.

The term "positive" is applied only to those smears containing numerous typical malignant cells. It seems evident that conservative reporting will lead to fewer false positive reports.

In addition to the examination for malignant cells, other abnormalities demonstrated in the vaginal smears are reported to the physician. These include the presence of Trichomonas vaginalis, and the degree of estrogenic activity as shown by the relative proportions of basal and superficial cells, particularly if the cytologic picture does not correspond to the patient's age or menstrual history.

RESULTS

Vaginal Smears. A total of 378 vaginal smear examinations were made on 355 patients. With few exceptions, each examination was made on two smear preparations. Of the 378 examinations, 354 were negative for malignant cells. Only one of these was from a patient with proven adenocarcinoma of the uterine fundus. The vaginal fluid was diluted with abundant blood and leukocytes, probably accounting for the failure to demonstrate malignant cells.

There were 16 examinations (32+ smears) in which the cells found were classified as suspicious. This series represents 13 patients.

Of these, one had a second negative smear, and no further examinations were requested by the physician.

Endometrial biopsy on the second patient showed an endometrial hyperplasia with groups of atypical non-malignant cells.

A third patient had two suspicious smears, followed by one smear classified as positive. Subsequent cervical and endometrial biopsy showed only a mild endometrial hyperplasia. Following this procedure, one smear examination gave negative results.

A fourth patient, aged 46, who had menorrhagia, had one examination showing a few suspicious cells plus hyperplastic endometrial cells. Two subsequent examinations showed negative smears.

A fifth patient, aged 22, with a serosanguinous vaginal discharge for several months, showed a few suspicious cells on one examination with two subsequent negative smears.

The sixth patient was 72 years of age and had had several episodes of vaginal bleeding. The first examination showed an atrophic smear with numerous basal cells plus numerous suspicious cellular elements. Two subsequent smears showed atypical cells interpreted as hyperplastic endometrial cells.

The seventh patient, aged 72, had had six months of vaginal bleeding. The initial examination was reported as suspicious and a second set of smears was reported as positive. Biopsy was refused by the patient but clinical signs of definite fundal carcinoma appeared subsequently.

The eighth patient, aged 68, with intermittent vaginal bleeding, had an atrophic smear with one suspicious cell present. Two subsequent sets of smears after administration of stilbestrol (1 mg. per day for 10 days) were negative.

The ninth patient in this group was 25 years of age and was in the sixth month of pregnancy. Two sets of smears were reported as suspicious. Further clinical examination showed a sessile, firm, 1 cm. elevated lesion on the cervix. Microscopic examination of the excised lesion showed cellular pleomorphism and increased mitotic activity of the squamous epithelium of the surface. This did not appear definitely malignant, but may have represented a precancerous lesion. Subsequent smears following local excision of the lesion were negative.

The tenth patient, aged 37, had had vaginal discharge and slight bleeding for one month. Clinical examination of the cervix showed nothing abnormal. Three sets of vaginal smears at intervals of ten days showed one to be suspicious, one negative, and a third to be again suspicious. Reexamination of the cervix showed no definite lesion except for a small bleeding point at one lateral margin of the cervix. Biopsy of this area (followed by fulguration) showed an early, infiltrating, epidermoid carcinoma. Serial sections of the cervix following total hysterectomy revealed no residual neoplastic tissue.

The eleventh patient, aged 56, had had intermittent vaginal bleeding following removal of small endometrial polyps one year previously. On the first examination, the smears contained a few suspicious cells which on five subsequent examinations were repeatedly demonstrated and considered to be hyperplastic endometrial cells.

The twelfth patient, aged 44, had one suspicious smear with no follow-up to date.

The thirteenth patient, aged 48, had no symptoms. Atypical cells were found in the first examination and numerous highly suspicious cells were present in the second examination. Cervical biopsy revealed an early infiltrating epidermoid carcinoma.

Eight sets of vaginal smears on seven patients were classified as positive. The first was from a woman, aged 35, with a recurrent rectal adenocarcinoma and a rectovaginal fistula following an abdominoperineal resection.

The second positive smear was from a 50-year-old woman with irregular vaginal bleeding. Biopsy and total hysterectomy revealed a malignant papilloma of the endometrium (adenocarcinoma-in-situ).

The third patient, aged 33 (the third patient in the suspicious group), had one positive smear. Biopsy of the endometrium and cervix showed no malignant tissue.

The fourth patient, a woman 61 years of age with post-menopausal bleeding, had one positive smear, and biopsy and total hysterectomy revealed a papillary adenocarcinoma of the uterine fundus.

The fifth patient, aged 72 (the seventh patient in the suspicious group), had one positive smear. Biopsy was refused, but definite clinical evidence of fundal carcinoma is present.

The sixth patient, aged 46, had no gynecological complaints or pelvic abnormalities. Two sets of smears were reported as positive, and one of four cervical biopsies taken in the four cervical quadrants and total hysterectomy revealed an early epidermoid carcinoma-in-situ.

The seventh patient, aged 70, had had a sanguinous vaginal discharge for one month. Following one positive vaginal smear (composed almost entirely of typical malignant cells), clinical examination and biopsy disclosed an extensive but superficial neoplasm covering the cervix and vaginal walls.

In summary, then, of 378 vaginal smear examinations on 355 patients, a positive diagnosis was made by smear in seven patients. In six of these, the presence of a malignant process was demonstrated either clinically or by biopsy. There was one false positive diagnosis. Of the 13 patients with 16 examinations, classified as having suspicious cells present, three were subsequently shown to have uterine carcinoma. In one patient, biopsy has not been done to date. Of the other nine patients with suspicious smears, one had a cervical surface lesion with atypical non-malignant epithelium; the remaining eight were not shown to have malignant disease. Hyperplastic endometrial cells and atypical basal cells were among the elements causing suspicion in this group.

Of 354 negative examinations, one was a false negative.

Sputum Smears. A total of 21 specimens of sputum from 14 patients were examined for malignant cells. On one patient with clinical and roentgenological evidence of a carcinoma of the upper lobe of the right lung and with negative bronchoscopic findings, four specimens showed only rare typical malignant cells and these smears were classified as suspicious. A fifth specimen contained definite clumps of malignant cells and was classified as positive. The diagnosis of bronchogenic carcinoma was confirmed later by biopsy of a metastasis and by autopsy. The rest of the smears on the other 13 patients were classified as negative, and these patients were shown subsequently to have non-malignant pulmonary disease.

Gastric Smears. Specimens of gastric fluid from 26 patients with achlorhydria were examined. All smears were negative. One patient had a gastric resection which revealed an infiltrating scirrhous carcinoma.

Urinary Smears. Fifteen single urine specimens from 14 patients were examined by the smear technique. Two were classified as positive; both patients had papillary carcinoma of the bladder. Of four patients with suspicious smears, one had clinical and roentgenological evidence of carcinoma of the kidney with pulmonary metastases, and one had a benign papilloma of the bladder. Of the nine negative smears, three were false negatives. One patient had an epidermoid carcinoma of the bladder and one had an adenocarcinoma of the prostate, both proven by biopsy. An additional patient with a negative smear had clinical evidence of carcinoma of the kidney with skeletal metastases.

Miscellaneous Smears. Miscellaneous fluids (cysts, abdominal, pleural, rectal and prostatic) were examined in only ten patients. There was one positive pleural fluid, later proven by biopsy. All other smears were negative, and there were no false negatives.

Addendum: In the 11-month period since this report was submitted for publication, 700 additional examinations were done on 611 patients. There were 569 vaginal smears examined (505 patients); the remainder were smears of sputum, gastric fluid, urine and other miscellaneous fluids. Of the vaginal smears, 550 were reported as negative, 12 as suspicious and 7 as positive. Of the 131 miscellaneous smears (106 patients), 98 were reported as negative, 15 as suspicious and 18 as positive. The total error on all smears was 5.4 per cent. The total error on vaginal smears was 3.6 per cent.

Grateful acknowledgment is given to Miss Barbara French for the careful technical assistance in this study.

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Contagious Ecthyma in Man

Earl H. Gray, M.D., *Woodland*

SUMMARY

The virus of contagious ecthyma of sheep and goats is transmissible to man.

The human infection is a relatively benign, self-limited disease. It is frequently encountered in sheep-raising areas among persons handling infected animals or the vaccine.

Usually only protective treatment is required, but x-ray therapy will produce prompt regression of the skin lesions.

SIX cases, in humans, of a disease which is transmitted from sheep to man and which in humans causes single or multiple skin lesions often accompanied by low grade fever and regional adenopathy, were observed by the author between 1935 and 1947. All the cases originated in Northern California.

The skin lesions were limited to the hands and fingers at a break in the skin as a site for inoculation of the infected material. In each case the patient first observed a small erythematous macule which extended and elevated in the succeeding week. From the histories it was apparent that the macules appeared between one and two weeks after inoculation.

In the second week there appeared a virulent lesion, a sharply circumscribed umbilicated bulla measuring one to several centimeters in diameter and covering a cyanotic reddish-purple edematous bed. Beyond the periphery was a variable-sized zone of erythema. A striking feature in contrast to this vivid lesion was the minimal amount of accompanying local discomfort.

In the cases observed it was noted that at the height of development of the bulla, fever of 99° to 100° might be encountered, together with moderate enlargement and soreness of the regional lymph nodes.

From the second to third week rupture of the bulla, denuding, regression of the underlying bed, and crusting occurred. There was spontaneous recovery in three to four weeks with minimal scar formation barely perceptible after a few months.

Three patients had single lesions (Figures 1 and 2). When multiple, the lesions are seen at various stages of development (Figure 3), and the history given indicated an interval of some days between the initial appearance of each. The oldest lesion was the most advanced, but wide variation in the extent of development or virulence of the several lesions was noted.

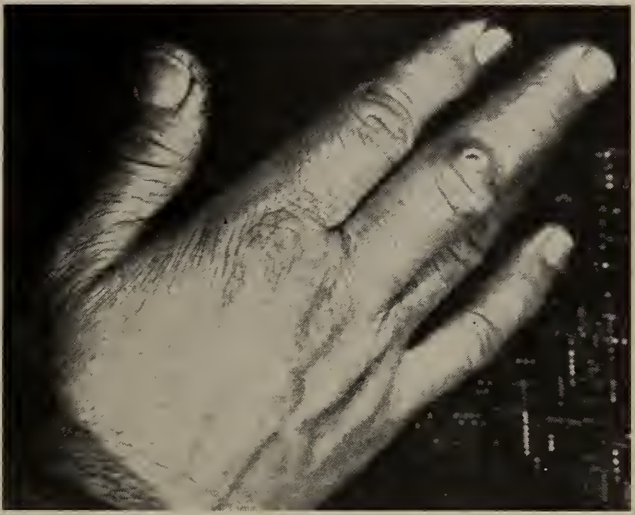

Figure 1.—Single benign lesion in second week.

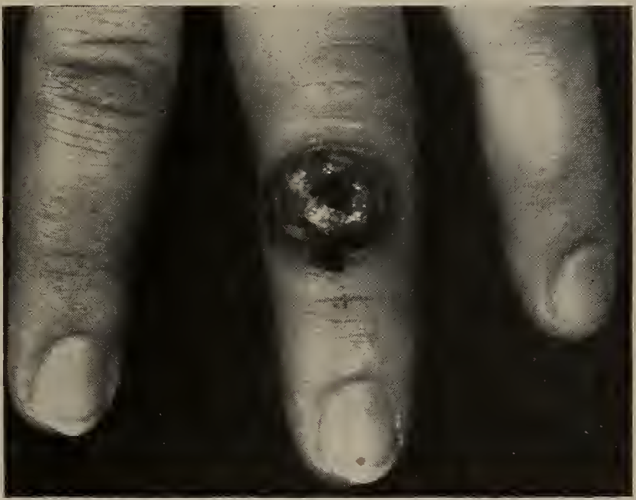

Figure 2.—Single virulent lesion in second week. Mild epitrochlear and axillary soreness.

No reinfection has occurred in any of the six patients. Several had had chickenpox, herpes simplex, or successful vaccination with cowpox; none had had herpes zoster.

Apparently medical advice as to this disease is not often sought unless the lesions develop to an unusual extent. Personal inquiries among sheep workers, and published reports in the literature,[3, 4, 5] indicate that contagious ecthyma is frequently transmitted to susceptible persons handling infected sheep, or the vaccine, and the lesions so acquired may often be minimal in size and virulence. When the infection is minimal and unrecognized, medical advice may not be obtained.

From the Department of Radiology, Woodland Clinic Hospital.

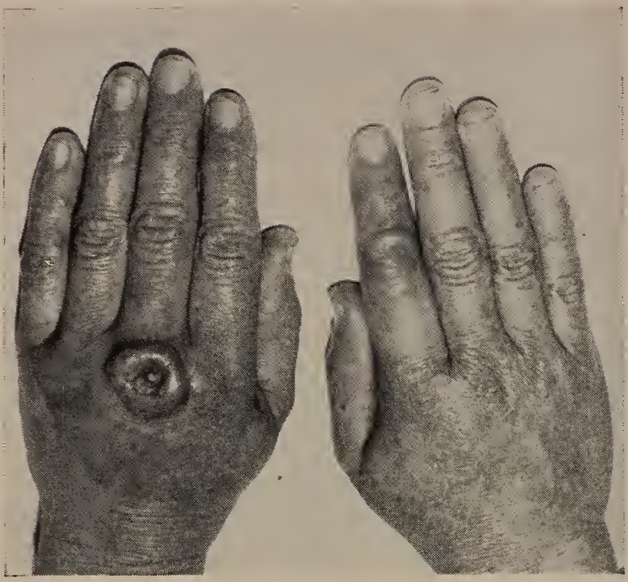

Figure 3.—Multiple lesions. Small lesion, 15 days, left little finger; large lesion, 12 days, left third metacarpal phalangeal area with large zone of erythema extending over dorsum of hand; medium lesion, 7 days, right index finger.

ETIOLOGY

Contagious ecthyma (sore mouth, doby mouth, infectious pustular dermatitis) has been shown to be a disease entity of sheep and goats, caused by a virus which is difficult to filter.[2] It has been known in many sheep-raising countries of the world, but it was apparently first reported in the United States when Howarth described the disease among sheep in California in 1929.[2]

The virus is considered to be quite resistant and may lie dormant in grazing areas for long periods.[1] It produces an eruption of pustules around the mouth, and in non-wool-bearing areas particularly about the head. Immunity against reinfection results and active immunization may be produced by vaccination.[1]

Material from the second patient observed by the author (in 1935) was successfully inoculated into scarified areas on a non-immune sheep, producing pustules as seen in contagious ecthyma.* A similar successful inoculation to sheep from a human lesion was described by Newsome in 1934.[4]

DIAGNOSIS AND TREATMENT

The inability to demonstrate specific organisms in routine bacteriological studies, the history of contact with the virus of contagious ecthyma of sheep, and the self-limited clinical course of the lesion progressing through the macular, papulovesicular, umbilicated bleb or pustular, and crusted stages are considered as criteria for diagnosis.

Treatment consisted of local cleansing and loose dry sterile protective dressings. Three patients at the height of bleb development were given a single medium voltage x-ray treatment (100 r in air). These treated lesions regressed promptly and healed more rapidly than the non-treated lesions.

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*With Dr. J. H. Howarth, Department of Veterinary Science, University of California at Davis, whose untimely death interrupted his immunological studies.

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CASE REPORTS

- Temporal Arteritis
- Charcot's Joint, with Unusual Features, in a Diabetic Patient
- Ruptures of the Umbilical Cord with a Case of Intrapartum Rupture of All Three Vessels

Temporal Arteritis

Thomas H. Lambert, M.D., *La Jolla, San Diego*

TEMPORAL or cranial arteritis is a relatively rare disease and the cause is unknown. Horton, Magath and Brown[2] first described this peculiar condition in 1932 and since that time 35 cases have been reported in the literature.

Outstanding characteristics of this febrile disease are painful inflammation of the temporal arteries and the average age incidence of 65, the incidence being greater in women.[4] Pain, usually temporal in location, but sometimes in the occipital and parietal areas when other vessels are involved, low grade fever, general malaise, anorexia, sweating, weakness and loss of weight are prominent symptoms which are present two to six weeks prior to obvious involvement of temporal arteries. Ocular disturbances such as diplopia, photophobia, ptosis and partial or complete loss of vision occur in a considerable number of cases.[1]

Symptoms and course of illness in all cases have been similar and the disease has affected persons in the same age group. The course of this clinical entity is toward recovery within two to six months, although temporary relapses have been noted.[5] No deaths have been reported due directly to the disease and the prognosis for complete recovery is good.

CASE REPORT

The patient, a white housewife, 65 years of age, when observed in the clinic November 25, 1946, complained of very severe headaches which had begun three weeks previously and shortly after recovery from acute coryza. Up until the present illness the patient had enjoyed exceptionally good health all her life, although there was a history of moderately severe dental caries since 1939.

There was excruciating head pain over both temporal areas and both sides of the face, but it was more pronounced in the right temporal region, and there was also moderately severe pain in the occipital area. The patient had been taking opiates every two to four hours for relief of pain.

Ten days before reporting to the clinic, she had begun to experience difficulty in opening her mouth because of pain in the temporomandibular joints, and she was unable to wear a hat due to sensitiveness over the forehead and temporal areas. She had lost ten pounds in three weeks, and there was almost complete loss of appetite. The patient complained of severe lassitude, fatigue, general malaise, night sweats, dullness of intellect, fever and nausea of three weeks' duration.

Examination: Physical examination revealed marked tortuosity, swelling, redness and tenderness along the course of both temporal arteries, more pronounced on the right side (see Figure 1). There was tenderness over both temporomandibular joints, the occipital area and cervical spine.

The vessels in the fundi of the eyes were tortuous, but there was no edema of the discs or evidence of hemorrhage. No visual impairment was noted. Many teeth were absent and several carious teeth present with evidence of pyorrhea of the gums. The tonsils were slightly enlarged.

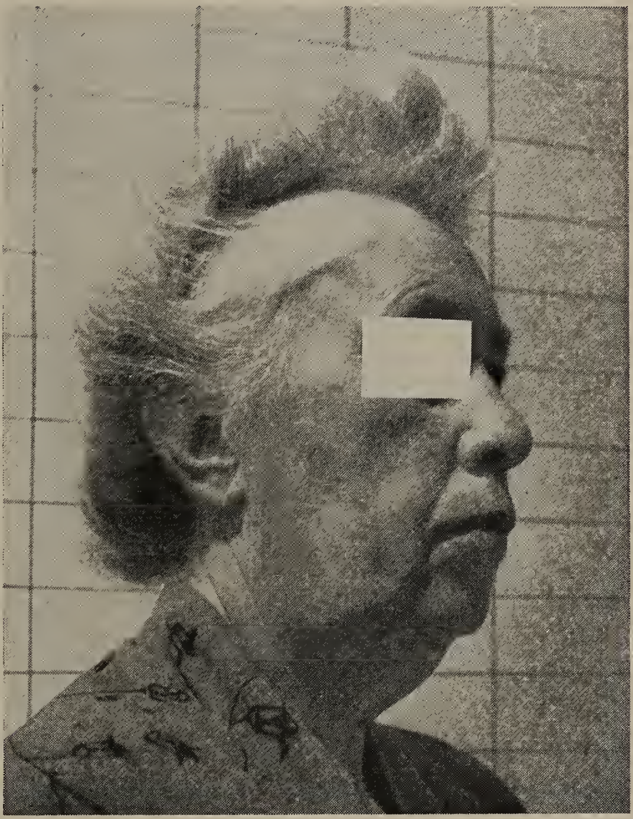

Figure 1

Laboratory Findings: At the time of admission to the clinic, erythrocytes numbered 4,140,000 with hemoglobin value of 75 per cent; leukocytes numbered 9,500 with 79 per cent polymorphonuclears, 16 per cent lymphocytes, 2 per cent monocytes, 1 per cent eosinophils and 2 per cent basophils. The blood sedimentation rate was 60 mm. in one hour. Platelets numbered 400,000 per cubic mm. Analysis of catheterized urine revealed a faint trace of albumin, 4 to 6 leukocytes per high-power field and a rare erythrocyte. No growth was observed upon urine culture. Agglutination for Malta fever, typhoid and paratyphoid was negative. Fasting blood urea was 35 mg., fasting blood sugar 92 mg., uric acid 3 mg., and total serum proteins 5.87 per 100 cc. Results of a Kahn test were negative and no growth was observed on a blood culture.

X-ray examination of the skull was reported as follows: "There is a thinning of the temporal bone along the course of the left anterior diploic vein. This is probably due to varicose dilatation of this vein. The left sphenoparietal sinus, into which the above vein empties, is also more prominent than usual. The bones of the skull otherwise have a normal appearance. The sella turcica is normal in size and shape." The right temporomandibular joint had a normal appearance by roentgenological examination. X-ray examination of the cervical spine revealed "narrowing of the sixth cervical interspace and moderate hypertrophic

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From The Scripps Metabolic Clinic, La Jolla, San Diego.

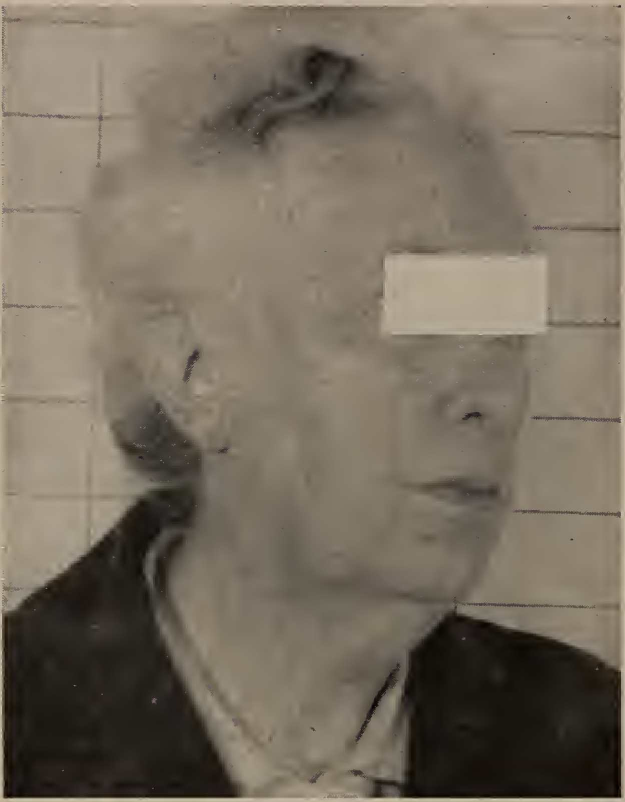

Figure 2

arthritic changes throughout the cervical spine." The chest was roentgenographically normal.

Basal metabolic rate was +12 per cent, and an electrocardiogram revealed left axis deviation.

Course in Clinic: Pain was constant and severe, and frequent administration of opiates was required for relief. At 8 p.m. on the second night following admission, the patient's temperature was 101.8° F. On the assumption that a systemic infection might be involved in this condition, penicillin in dosages of 40,000 units every three hours was begun at this time, and the following morning at 8 o'clock the temperature was recorded at 99.4°. Thereafter, it continued below 100° and down to normal for the remainder of the period of hospitalization. Sodium salicylate 1.2 gm. with sodium bicarbonate 0.2 gm. thrice daily was started on the third day after admission and continued for three weeks. X-ray therapy to each temporal area was given twice the first week of hospitalization.

A total of 2,240,000 units of penicillin was administered. On the fourth day the pronounced signs of inflammation along the temporal arteries were subsiding, although the tenderness and severe headaches continued. After two and one-half weeks there was less severity and frequency of head pain and also diminution in tenderness over the temporal regions. From this time until dismissal from the clinic on January 15, 1947 (see Figure 2), there was gradual improvement with slow subsidence of temperature to normal.

In spite of supplemental iron and vitamin therapy, frequent recheck examination showed a decrease in erythrocytes to 3,640,000 and in hemoglobin to a value of 64 per cent within four weeks. This was attributed to the fact that the patient could not take a well balanced diet due to nausea.

The patient was seen at frequent intervals after leaving the clinic, and the remaining diseased teeth were extracted April 29, 1947. The last erythrocyte count, June 26, 1947, was 4,700,000, with a hemoglobin value of 90 per cent; leukocytes numbered 7,450, and the differential count was normal. There were no head pains or fever and both temporal arteries were normal upon examination. The patient had resumed her usual activities.

COMMENT

In this case the process apparently subsided before the temporal arteries became thrombosed. Biopsy of the affected vessels was deferred due to the early signs of improvement in the patient's condition. As a rule, the course of this illness seems to be unaffected by treatment of any kind. Study of microscopic sections from biopsy segments of involved arteries reveals the condition to be one of chronic periarteritis and arteritis.[3]

SUMMARY

A case of temporal arteritis has been reported because of the rarity of the disease and the scarcity of reports of such cases in the literature.

Outstanding characteristics of this febrile disease are painful inflammation of the temporal arteries and the average age incidence of 65, the incidence being greater in women.

Prominent symptoms such as pain, low grade fever, malaise, anorexia, weakness and loss of weight are present usually two to six weeks prior to obvious involvement of the temporal arteries.

The course of illness is toward recovery, with a duration of two to six months, and it seems to be unaffected by treatment of any kind.

No deaths have been reported due directly to the disease and the prognosis for complete recovery is good.

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Charcot's Joint, with Unusual Features, in a Diabetic Patient

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As IT was not until recent years that Charcot's joint, or so-called neuropathic, "trophic," degenerative bone lesion, was shown to occur in connection with diseases other than syphilis, the literature contains few reports of cases except those of syphilitic origin.

The case to be reported is one of Charcot's joint in a diabetic patient who, although he had had syphilis, apparently had been cured of that disease several years before, without recurrence.

The largest single group of cases of Charcot's joint in diabetic patients was reported from the New England Deaconess Hospital by Bailey and Root[1] in 1947. They reported 17 cases of lesions of bones of the foot in patients with diabetes, some of whom had demonstrable disease of the nervous system. In 1948, Hodgson, Pugh and Young[3] reported from the Mayo Clinic 61 cases of degenerative lesions of bones of the foot. In 19 of these cases the patients had diabetes alone, and in them no disease of the nervous system was demonstrated. Other reports of one or two cases are on record. Foster and Bassett[2] in 1947 presented a comprehensive discussion of the possible pathogenesis, along with reports of two cases.

CASE REPORT

The patient, a white male, 38 years of age, was admitted to Mercy Hospital, San Diego, for 14 days in April 1948. After several months in the Army in 1943 he had been discharged, apparently for a variety of reasons, including inability to stay awake. Diabetes had been diagnosed later and had been under fairly adequate control since then. About seven months before admission to hospital, the patient noted rather sudden pain in the first two toes of the left foot, along with swelling and tenderness. He continued in his occupation of bartender, however, and about a week later a small piece of bone extruded through a small draining sinus that had appeared at the base of the second toe. After about three months the foot improved and was fairly usable until March 1948, when swelling and tenderness recurred. Diabetes meanwhile had been fairly well controlled with daily doses of about 30 to 35 units each of protamine zinc and regular insulin. The last known blood sugar level before hospitalization was 176 mg. per 100 cc. four months previously. There had been an occasional minor reaction to insulin. Urine tests done by the patient had shown an occasional trace of sugar. Diabetic cataract had been diagnosed in 1945.

In 1935 syphilis had been diagnosed and intensive treatment had been given in the U. S. Army and Navy Hospital in Hot Springs, Arkansas. The patient had been discharged as cured but subject to follow-up, which had been done periodically since, with blood and spinal fluid being found normal.

Upon physical examination in the hospital it was noted that the left lower extremity was swollen almost to the knee, with swelling diminishing upward from a maximum in the region of the ankle, where pressure left a pit in the flesh. With the patient standing, there was rather marked cyanosis of the foot distal to a point proximal to the metatarsophalangeal joints. Although cyanosis disappeared rapidly with the patient recumbent, the swelling remained. Pulsations at all points were normal to palpation. Thermocouple studies of both lower extremities showed no significant variations.

Extensive varices of the left thigh and leg, involving both the long and short saphenous systems, were noted with the patient standing. The site of extrusion of the bone spicule was noted at the base of the left second toe but the sinus was closed. The foot was somewhat splayed and thickened through the metatarsal arch. Besides the previously mentioned cyanosis, the skin at the swollen area had the "dried apple" appearance of skin stretched over edema. No gross disturbance of sensation of touch, pain or position could be demonstrated.

There was a cataract on the lens of the right eye. The fundi were approximately normal with no retinopathic changes noted. The pupils reacted normally to light and to accommodation tests, and external ocular motions were normal. Marked caries in the teeth and generally poor oral hygiene were noted.

Blood pressure was 145 mm. of mercury systolic and 70 mm. diastolic, but the cardiovascular system otherwise was apparently normal. Hemoglobin was 13.5 gm. per 100 cc., and leukocytes numbered 12,450 per cmm. Blood sugar rose to as high as 216 mg. per 100 cc., blood urea was 29 mg. per 100 cc., and the uric acid content of the blood was 4.6 mg. per 100 cc. Serum calcium and serum phosphorus values were, respectively, 9.0 mg. and 3.9 mg. per 100 cc., and alkaline phosphatase was 2.3 Bodansky units. The ratio of serum albumin to serum globulin estimations was 2.0 gm. to 5.4 gm. per 100 cc. on one occasion, while on another it was 3.8 gm. to 3.9 gm. Results of a cephalin flocculation test were within normal limits, as were also the results of bromsulfalein and serum Kline and Kahn tests.

Spinal fluid cell count, colloidal gold and Wassermann reaction were normal. The protein content of the spinal fluid was 95 mg. per 100 cc.

Because of the abnormal levels of protein in the serum and spinal fluid, and to further the search for a possible cause of the bone lesion, a smear of bone marrow was examined. The normoblast-myeloid ratio was 1:5, and in 500 cells examined nothing abnormal was noted.

Roentgenograms of both hands, both feet, and the chest revealed only low-grade osteoarthritic changes in the right foot, involving the metatarsophalangeal joint of the great toe, dissimilar radiologically from the changes in the left foot, which were as follows: There were degenerative, destructive and proliferative changes involving both the phalanges and the metatarsals. The metatarsophalangeal articulation of the great toe was completely disorganized, with a dispersal of calcerous material in the soft tissues. Similar changes, although less pronounced, were noted in the metatarsophalangeal articulations of the second toe. There was a fracture of the distal end of the proximal phalanx of the fourth toe and a fairly well marked area of destruction in the medial aspect of the head of the fifth metatarsal bone. Diffuse osteitis or subperiosteal calcification was noted along the margins of the first, second and third metatarsal bones. There were similar changes in the proximal phalanx of the second toe.

A patch test showed no tuberculin sensitivity, and when 0.1 cc. of coccidioidin test material was administered intracutaneously, no reaction was noted after 72 hours.

COMMENT

Since it has been shown that Charcot's joint can occur in connection with other diseases than syphilis, diabetes being one of them, it appeared that this case fell into that category, especially as there was no discoverable evidence of syphilis (of which the patient apparently had been cured several years previously) or of syringomyelia, another cause of such lesions of the so-called neuropathic variety. The exact nature of this disease of the bone and its pathogenesis are not clear, but it is obvious that profound changes of the body economy accompany it. In the case reported, there were moderately severe diabetes, lenticular degeneration of the right eye, reversal of the albumin-globulin ratio of the serum (the authors were unable to find reference to this phenomenon in any report of a case of the disease) and pronounced elevation of the spinal fluid protein content with no other changes of the spinal fluid. With relation to the spinal fluid protein content, the experience of other observers has been as follows: Jordan[4] reported from the Joslin group that in 40 cases in which tests were done, the total protein content in the spinal fluid was above 50 mg. per 100 cc. in 22 cases, and the highest level in any case was 120 mg. Bailey and Root[1] reported an average of 69 mg. per 100 cc. in their series, with 100 mg. recorded in two cases and 112 mg. in one.

In the case reported herein, the absence of accompanying neurologic changes attributable to the diabetes is to be noted. The significance of the varices in the leg above the affected foot is debatable, but in this regard the absence of varices in the other leg is at least worthy of note. Whether or not there is significance in stasis of circulation in combination with other factors present is a subject for conjecture.

The objections of Hodgson, Pugh and Young[3] to considering these bone lesions in diabetic patients and in other patients in their series as antedating the soft tissue injury which always accompanies them, apparently are well based. However, their denial of a disturbance of nerve supply, either somatic or autonomic, seems not well founded, since there appears to be abundant evidence, clinical and experimental, that damage to the nervous system can and does produce such lesions—whether primarily in the bone or in the soft tissue being beside the point. The Guillain-Barre type of albuminocytologic dissociation present in this and other cases reported may point toward some sort of radiculoneuronitis. At least it must be admitted that there is sufficient irritation of the central nervous system to produce pronounced elevation in protein content in the spinal fluid. Why, in the case herein reported, there should also have been a reversal of the albumin-globulin ratio is a mystery, unless one might postulate damage to the protein-forming function of the liver and reticuloendothelial system accompanying the diabetes of long standing.

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Ruptures of the Umbilical Cord with a Case of Intrapartum Rupture of All Three Vessels

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For practical purposes it would seem fitting to classify ruptures of the umbilical cord as (a) partial, and (b) complete. Under partial ruptures should be included:

1. Rupture of a varix of the umbilical vein.
2. Tearing of one or two of the three blood vessels.
3. Discontinuity of the epithelium covering the cord, with resultant extrusion of Wharton's jelly.

Bleeding from vessels in velamentous cord insertion is not uncommon. Partial ruptures have been discussed by Forsell,[5] and cases reported by a number of authors. In a case reported by Page,[7] a bleeding placental artery was tied prior to delivery and the child was saved.

Complete ruptures of the cord have been reported by Dyrenfurth,[4] Douglas,[3] Siddall[10] (first case), Baldi,[1] McClintock,[6] Bloxsome,[2] and Sackett.[9] Although the authors could find only these reports of a total of seven cases of complete cord rupture in the literature available in Honolulu, no doubt it is not too rare an occurrence.

ETIOLOGY

Among the causes of cord rupture are: (a) velamentous cord insertions, (b) absolute or relatively short (by wrapping about neck or extremities of fetus) cords, (c) localized necrosis in the cord, (d) hemangioma of cord vessels, (e) trauma due to podalic version, forceps blades, etc., in manipulative deliveries.

ANATOMICAL CONSIDERATIONS

According to Spivack[11] there is some evidence that there are nerve fibers in the intra-abdominal portions of umbilical arteries. In addition, Spivack brings out the fact that the blood vessels of the umbilical cord differ anatomically from other vessels of similar caliber in the following ways: (1) The presence of folds and nodules of Hoboken in arteries and of semilunar folds in the vein, (2) the absence of true valves, (3) peculiar distribution of elastic tissue, (4) strongly developed arterial media whose powerful contractions are sometimes ascribed to the spiral or snail-like course of its muscle fibers, (5) absence of vasa vasorum and adventitia, (6) presence of a delicate connective-tissue stroma which contributes to the sponginess of the veins, (7) a nerve apparatus not yet positively demonstrated.

As a result of these various factors it is brought out that the umbilical arteries are almost impervious to the blood stream soon after birth. This seems to explain why Rachmanow,[8] in 1914, reported several thousand cases in which the umbilical cords were not tied and not a single newborn died from hemorrhage. These anatomical considerations will explain at least in part why at death there was seldom more than a small amount of intra-uterine bleeding despite severing of the umbilical arteries intrapartum. McClintock,[6] describing a case in which there was no bleeding from either end of the severed cord, concluded that the infant had died of asphyxia rather than hemorrhage. In several other cases also the amount of blood was minimal.

CASE REPORT

A 25-year-old primigravida was admitted to the Kapiolani Maternity Hospital Nov. 7, 1947. The estimated due date was Oct. 26, 1947. The course of the pregnancy had been uneventful prior to the onset of labor, and all laboratory tests revealed normal findings. Onset of labor was spontaneous, and the first stage was 15 hours and 20 minutes long. The second stage lasted 26 minutes. The fetal head engaged in the left occiput transverse position and apparently maintained this position until the cervix was fully dilated. Fetal heart tones had remained strong and regular until the fetal head reached to 2 cm. below the ischial spines. At this stage, the fetal heart rate rose suddenly and without warning to a rate too rapid to count and then suddenly ceased. No external bleeding was noted. The patient was draped quickly and under light cyclopropane anesthesia the fetal head was rotated easily from left occiput transverse to right occiput anterior position, using the Barton forceps. The delivery was completed by delivering the fetal head with Simpson forceps. Left mediolateral episiotomy was done. The fetal head was at plus 2 cm. below the ischial spines at the time of delivery and the cervix was fully dilated. Membranes were artificially ruptured just prior to the delivery. A large amount of meconium escaped along with amniotic fluid but a very small amount of dark red blood was present. The umbilical cord was looped once about the infant's neck and once in a complete turn around its right arm in the antecubital space. Where the cord crossed the antecubital space all three vessels—the two umbilical arteries and one umbilical vein—were completely severed. The cord was held together by a shred of epithelium not more than 0.5 cm. wide and infinitesimally thin. This was regarded as a complete severance of the cord inasmuch as the three vessels were totally cut through and the ends widely separated. There was no active bleeding in progress. The total amount of visible blood was not more than 5 cc. Trauma such as pinching of the cord by the forceps during delivery was ruled out by careful examination of the fetal head at the time of forceps application and prior to traction. A search was made for prolapsed cord and none was found.

From the Obstetrical Service of the Kapiolani Maternity Hospital, Honolulu, T. H.

Careful inspection revealed that the tear had occurred at a natural kink in the cord. This kink showed a lesser and a greater curvature and it would seem that the continued tension on the cord in late second-stage labor caused the shorter and inner portion of the kink in the cord to give way, shearing off the three umbilical vessels and leaving a narrow shred of the greater curve of the kink still holding.

It is believed that intra-uterine death occurred by asphyxia as it did in McClintock's[6] case, rather than by hemorrhage.

SUMMARY AND CONCLUSIONS

Partial severing of umbilical cord vessels has been reported fairly commonly in the medical literature.

We have been able to find reports of only seven cases of the severance of all three umbilical vessels during labor.

An eighth case of intrapartum avulsion of all three vessels is presented.

Etiology is discussed and attention is called to the role of actual and relative shortening of the cord in causing cord severance, especially if the cord contains kinks.

There is strong evidence that fetal death is more apt to occur from asphyxia than from hemorrhage, as blood loss is usually minimal when the vessels are completely severed.

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California Cancer Commission Studies*

Chapter XXIX

Tumors of the Brain and Spinal Cord

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If a brain tumor is suspected, the diagnostic aids to prove or disprove its presence are numerous. Thirty years ago they were unknown. These are pneumoencephalography, electroencephalography, and arteriography. By one or the other, and not infrequently by information from all three, the site of the neoplasm can be determined, and the pathologic structure and size of the lesion as well. All of this has contributed to an early identification and given assurance in the selection of the surgical approach and the method of treatment.

The responsibility for suspecting a tumor in its early stages rests upon the physician who is consulted first. Under what conditions, then, should one suspect a neoplasm? Obviously not when one is confronted with fever and evidence of infection, and not when there are clear indications of more than one localization, such as signs pointing to both hemispheres or to several areas in the nervous system.

When the signs or symptoms can be explained on the basis of a single lesion *which is progressing,* one should think of tumor. The rate of onset gives a clue. An embolic lesion appears instantaneously, a hemorrhage occurs in a matter of minutes, a thrombosis usually over hours. Tumors give indications of their presence over weeks or months. A progressive single lesion implies growth, and adequate diagnostic methods are required. One should not delay for the appearance of signs and symptoms indicative of its space-consuming ("chorophagic") nature, such as choked disks, headaches, vomiting, or other evidences of advanced intracranial pressure. In the late stages, the individual harboring a tumor presents evidence of a single, progressive and chorophagic lesion.

The presenting symptoms may be varied. Contrary to the prevailing impression, chronic, constant headaches are not indicative of tumor. Adults who, without previous head injury or syphilis, develop *fits* are suspect. *Progressive paralysis, aphasia or dysphasia, complaints referable to ear or eye with increasing loss of function,* all demand investigation. Too often, in the absence of neurological findings, complaints combined with some *changes in temperament* cause the patient to be referred to the psychiatrist, and the true nature of the trouble is unrecognized. *Vomiting* as a primary symptom is not infrequently seen in children with posterior fossa tumors, and may antedate the appearance of other signs by weeks or months so that psychogenic cause may be suspected. In the cerebral tumors of adults, vomiting is not a prominent symptom.

The neurological findings on clinical examination, together with plain x-ray films, are usually sufficient to diagnose a tumor. The diagnostic aids employed by the neurological surgeon are required for more accurate localization so that the procedure selected for removal will involve the most direct approach with minimum tissue resection. They also give additional information useful in forecasting the type of tumor, the variety of neoplasm, or the presence of an aneurysm.

Some generalities may be permitted. Subtentorial tumors predominate in childhood; viz., the midline medulloblastomas originating in the roof of the fourth ventricle, the astrocytomas unilateral in origin, and the less frequent ependymomas. The craniopharyngiomas (Rathke pouch tumors) in most instances give evidence of their presence in childhood.

Supratentorial tumors predominate in adults, particularly in middle age, and are more common in the anterior and middle portions of the hemispheres than posteriorly. The origin of the meningiomas is indicated by their name. In this sense they are not truly brain tumors. They grow over a period of years, rarely become sarcomatous, but may invade or penetrate bone in advanced stages. Ordinarily they are encapsulated, benign, and do not recur if removed with the invaded dura. They are rare in the young and reach the peak of their frequency in adults around the age of 45. It is in persons in this age period, too, that the acoustic neurinomas are observed. These posterior fossa tumors progress over years, giving rise to tinnitus with progressive deafness and nystagmus long before intracranial pressure and cerebellar signs appear. In the cerebral hemispheres, chiefly in adults, are seen the slowly growing, relatively benign gliomas—the astrocytomas and oligodendrogliomas—which repay radical removal with long periods of life and even cure.

The *bête noir* of the brain surgeon is the glioblastoma multiforme. Highly malignant, rapid in growth, often involving motor or speech areas, occurring in the most active period of middle age, relatively insensitive to x-ray, it recurs within weeks or a few months after even the most radical removal.

There are four types of pituitary adenomas. The chromophobe adenomas, most common of all, occur in middle age, and failure of vision or field defects bring them to the attention of the physician. It may then develop that the patient, if a woman, has consulted the gynecologist because of amenorrhea, or if a man, because of impotence. The eosinophilic adenomas are usually recognized because of the action of the acidophilic cells, which secrete growth hormone and produce gigantism or acromegaly or both. The basophilic adenomas are suspect in "Cushing's disease" but they present clinical pictures indistinguishable from certain primary adrenal growths. The malignant pituitary adenomas are so called largely because they have burst their capsular confines.

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*Organized by the Editorial Committee of the California Cancer Commission.

Metastatic tumors to the brain from distant primary sources constitute perhaps 3 per cent of brain tumors, and frequently attract attention before the primary tumor is evident. The lung, breast, and melanotic growths are likely sites of origin. The bowel and adrenal gland are less commonly the sites of origin.

Primary intracranial tumors have a distinctive way of spreading, not through the blood stream or lymphatics, but by seeding and sowing implants along the pathways of the cerebrospinal fluid. By this process it is common in the medulloblastomas of children to have the late development of a paraplegia from a separate implant in the spinal canal. Such a spread is less often seen with glioblastomas and ependymomas, and rarely with astrocytomas. In countries where echinococcus infestation is common, multiple space-consuming lesions have this special implication.

By roentgenographic study, even without the special techniques of air injection or arteriography, additional diagnostic information is readily obtained. The films may show the results of increased pressure; namely, the separated sutures (readily anticipated by a cracked-pot note on percussion of the skull), or the beaten silver appearance. The former occurs in younger children and the latter seldom is seen in patients beyond the middle of the third decade. The pineal, if calcified, may be shifted away from the hemisphere of greater volume and higher pressure. An enlarged sella turcica may indicate a hypophyseal adenoma, a flattened or enlarged one point to a Rathke pouch tumor with its spotty calcification. A spread and enlarged sella should always, however, bring to mind the possibility that one is dealing with a large third ventricle with hydrocephalus. Localized bone changes—thickening, rarefaction and destruction—are all seen at various stages with meningiomas. Metastatic tumors, epidermoids, and myelomas are accompanied by fairly characteristic bone changes. Certain tumors are prone to show calcifications. The Rathke pouch tumors have been mentioned as one variety, but a high percentage of the oligodendrogliomas do also, and a considerable number of astrocytomas and aneurysms. In other lesions calcification is less frequent.

Successful surgical treatment of intracranial tumors is dependent upon their accessibility, their type, and the stage at which they are diagnosed. The outcome is determined by the extent of involvement of important areas (motor, speech, etc.). Approximately 55 per cent of all intracranial tumors fall within the favorable, i.e., removable group, granting that a reasonably early diagnosis is made and that surgical treatment is properly executed. Improved anesthesia, the electrosurgical unit, the newer hemostatics, and the antibiotics, have supplemented the diagnostic aids mentioned above. As a result, tumors formerly unapproachable, or removable only in part, can now be eradicated. With these advances also, the operative mortality for intracranial new growths varies between 10 and 15 per cent.

* * *

Neoplasms of the Spinal Cord

Twenty-five years ago a survey of the cord tumors treated at the University of California Hospital revealed that each patient consulted on an average of 18 physicians before a diagnosis was made. Today the situation is vastly different, and the diagnosis is usually suspected before an advanced stage of paralysis is reached.

The *bilaterality of sensory, motor or reflex changes*, in the lower extremities alone, or in all four extremities, indicates the likelihood that the site of trouble is in the spinal canal. The progressive feature suggests a growth. A partial or complete blockage of the canal shown by spinal puncture and the Queckenstedt test confirms the physical characteristic of the lesion.

A constant radiation of radicular pain, usually worse at night, may indicate tumor long before other signs appear. Such a complaint merits a spinal puncture, Queckenstedt test, estimation of the spinal fluid proteins, and x-ray study. With the establishment of a definite level of sensory alteration and gradually developing disability below it, a growth should be diagnosed.

Fifty per cent of primary cord tumors are encapsulated, benign meningeal tumors or neurofibromas. The latter may be multiple in von Recklinghausen's disease. With such extramedullary tumors the sensory changes, although not necessarily uniform, are more pronounced in the distal parts of the extremities. Involvement of the sphincters is a late manifestation. Pain, not usually intense, is greater than with the intramedullary growths. The latter are apt to be ependymomas, other types of gliomas, or epidermoids. Sensory changes may, with laterally placed tumors, be of Brown-Sequard type. The intramedullary tumors produce the most marked sensory changes in the segments corresponding to their extent in the cord, rather than in the distal parts of the extremities. Tumors in the lumbar canal, because of involvement of the cauda equina rather than of the spinal cord, are associated with decreased reflexes in contrast to the increased reflexes characteristic of cord lesions. They should always be suspected when bilateral sciatica is present. These tumors, because of the ready displacement of the cauda, may attain huge size before neurological signs appear.

Variations in the neurological picture caused by cord compression are as numerous as the possible locations of the lesion from sacrum to foramen magnum. When compression of the cord is suspected, spinal puncture and the studies mentioned above should be performed. When further details of the level of the lesion are required, fluoroscopic study with x-ray pictures may be obtained by the introduction of radiopaque material into the spinal canal. Pantopaque is at present the most satisfactory material used for this purpose and may be aspirated and removed under the fluoroscope at the conclusion of the study.

Bone disease which causes cord compression may be demonstrated by plain x-ray films. Primary bone growths, such as giant cell tumors, and metastatic lesions, from the prostate or other sources, are not uncommon. The granulomas, particularly tuberculomas and their associated extradural abscesses, may be shown. Because of the common extension of extradural tumors through the intervertebral foramina, giving rise to the shape known as dumb-bell or hour-glass, complete x-ray studies should include three-quarter views as well as anteroposterior and lateral pictures. These may show enlarged foramina. Widening of the spinal canal by enlarging tumors may be demonstrated.

The extradural tumors include growths of blood vessel origin, occasional lipomas, chondromas, and some of neurogenic origin. These are frequently of the hour-glass type.

Surgical removal of the benign, intradural but extramedullary tumors, which constitute about half of all cord tumors, is highly satisfactory, the results being brilliant and the operative mortality about 1 per cent. Except in neglected cases, complete recovery is obtained. With the other types, operative removal and relief of cord compression may be combined with deep therapy.

SUMMARY

One should think of a tumor of the central nervous system when the signs and symptoms can be explained on the basis of a single lesion which is progressing.

The diagnosis of a tumor is established if in addition there are evidences that the lesion is space-consuming. These evidences are signs of increased intracranial pressure with brain tumors and indications of blockage of the spinal canal as shown by the Queckenstedt test with cord tumors.

"Bone Tumors" by Don King, M.D., Chapter XXX of the California Cancer Commission Studies, will be published in this section of the June issue of CALIFORNIA MEDICINE.

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EDITORIALS

Industrial Cases

California doctors are continuing their effort to secure the adoption or recognition of a schedule of fees for industrial cases which shall be fair, reasonable and equitable. Such a schedule has not heretofore existed and it seems that the path toward securing one is beset with numerous obstacles. Nevertheless, the effort shall and must continue.

Last September the California Medical Association presented its application to the Industrial Accident Commission for approval of a proposed schedule of fees for compensation cases. The Commission in November tabled this application and, at the same time, disowned any statutory authority to make and enforce a schedule of medical and surgical fees. Simultaneously, the Commission announced its intention of recognizing until next June 30—as it has done since 1914—a schedule of fees previously adopted officially by itself. Thus, in one breath, the Commission blows hot and cold on its own authority to set compensation medical fees. Both doctors and insurance carriers have been marvelling at this thermal feat.

The California Medical Association then came out with the recommendation that its members adopt for their own use the fees recommended in the September 1947 petition to the Industrial Accident Commission. Many of the insurance carriers countered by agreeing among themselves to pay only those fees adopted as an official act of the Commission in 1946. Today, under this situation, the doctors are charging one set of fees and some insurance carriers are paying another. To the credit of many insurance carriers and self-insurers, it should be recognized that the proposed 1949 fees are being paid without question in many cases.

A possible end to the impasse is being tried out in the meeting of joint committees of the Association and the insurance carriers. These committees are engaged in the effort to adjust differences of opinion and to arrive at a schedule of fees which will be mutually acceptable to physicians and insurance interests. Such a schedule is distinctly within the realm of reason, provided only that reason prevails in discussion of it and in the attitudes of the participating conferees. The Association's committee has been selected on the basis of experience and reason alike, and the insurance representatives have been chosen on a similar basis. Thus there appears every chance for a successful conclusion to this perennially difficult problem.

The principal stumbling block confronting the joint committees are the time limit of next June 30 (after which time the Industrial Accident Commission has decided to wash its hands of the entire matter of fee schedules) and the presence before the State Legislature of several bills which would grant specific statutory authority to the Commission to promulgate and enforce schedules of fees and charges for medical, hospital and other services provided to injured workmen.

If the June 30 deadline is passed, there is bound to be tremendous confusion in the whole field of industrial medicine. Doctors will need a guide in assessing their fees for services rendered and insurance companies will no doubt expand their efforts to establish limited panels of physicians to treat injured workmen, probably at reduced fees. If the bills now up in Sacramento are adopted, the Commission will be given absolute authority to set medical and surgical fees at any level and possibly at levels which have no bearing on the actual value of such services. This blanket authority does not appeal too much to those providing the services, which would be unlimited in the scientific sense but under strict regulation and limitation in the economic way.

The California Medical Association is geared to meet whatever developments take place in this matter of industrial fees. Its obligation is to its entire membership and not primarily to those few physicians who see fit to contract with insurance carriers for medical services under conditions and at rates which are impossible, economically and ethically, for their many colleagues.

It is to be hoped that the dangers inherent in the present and proposed programs of departmental control over professional practices may be avoided by common-sense activities by the joint medical-insurance committees now meeting. The solution lies in the recognition of the respective rights of the parties at interest, primarily those of the injured workman.

* * *

Letters to the Editor . . .

Gluten Intoxication

It was shown by Wagner and Elvehjem[3] that "running fits" or so-called "canine hysteria" can be induced in dogs by feeding them a ration containing wheat gluten. Convulsive seizures typical of these attacks suggested the possibility that canine gluten toxemia might be related to human epilepsy.[1] To test this possibility, Newell[2] and his associates of the Departments of Neurosurgery and Medical Electronics, University of Wisconsin, determined the electroencephalogram changes induced in dogs by gluten feeding and compared them with the known changes observed in epileptic patients.

Eighteen mongrel puppies ranging in age from six to eight weeks were used in this work. Each animal was dewormed and dusted with D.D.T. before the experiment was begun. For a week or more before the operation and during the period when normal electroencephalograms were taken, each animal was maintained on a control diet containing 20 per cent casein as its main source of protein.

With the animals under deep nembutal anesthesia, four tantalum electrodes were placed extradurally in each dog. The technique was the same as that used in clinical electroencephalography except that the electrodes were anchored firmly to the bone in order to minimize movements. All records were taken without the use of any anesthetic or drug. After several satisfactory normal records were obtained, 20 per cent wheat gluten was substituted for casein in the control diet. Generalized convulsions were frequently observed within three to ten days after this change, although an occasional dog was fed gluten for as long as five weeks without an epileptic seizure.

In a typical record on the control diet the electroencephalogram (E.E.G.) showed a moderate voltage activity with a predominant frequency of 8 to 10 per second. On changing to a diet including wheat gluten no change in voltage activity was noted during the first eight days. On the 11th day there occurred a definite change in the E.E.G., with the appearance of high voltage slow waves at a frequency of 2 per second. No outward change in the appearance of the dog was noted until the 21st day, when a series of convulsions occurred. A record taken two minutes after one of these convulsions showed many spikes with some low voltage waves at a frequency of 5 per second. A record two days later showed occasional high voltage waves at a frequency of 2 per second. Both the seizure and interval E.E.G. were thus comparable to those recorded in human epilepsy.

The following day casein was substituted for gluten in the diet of this dog. Seven weeks later the E.E.G. showed a normal pattern with a moderate voltage activity with 8 to 10 waves per second. One month later there was a temporary partial reversion to the wave pattern seen when the animal was fed gluten. This fluctuating abnormality in E.E.G. after gluten feeding has been observed on several other dogs.

This apparent identity of human epilepsy and canine gluten convulsions suggests that a more detailed study of this parallelism may lead to conclusions of practical clinical interest. Such detailed work is now in progress in the Wisconsin laboratories.

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NOTICES AND REPORTS

The A.M.A. Plan of Campaign Against Compulsory Health Insurance

STRATEGY AND POLICIES

Presented by Clem Whitaker and Leone Baxter, Directors of the National Education Campaign of the American Medical Association, for the Conference of State Medical Societies, Chicago, February 12, 1949.

Clem Whitaker: American medicine, in its campaign against compulsory health insurance, cannot afford to fight alone.

This must be a campaign to arouse and alert the American people in every walk of life, until it generates a great public crusade and a fundamental fight for freedom.

We must make every American know that medicine is not simply fighting for self-interest, but is actually fighting to avert the creeping paralysis of bureaucratic regimentation of the people's lives.

We need the help of every American who honestly believes in the American way of life—and our campaign must be geared to that help.

Any other plan of action, in view of the drift toward socialization and despotism all over the world, would invite disaster.

Doctors don't need to stand alone in this battle. They must not stand alone. And it's our job to see that they don't stand alone.

That's the reason that the American Medical Association, in establishing its National Education Campaign, has set as one of its major objectives—the mobilization of other great national organizations representing other professions, trades and businesses; civic and fraternal, religious and patriotic groups; women's clubs, farm and veterans' organizations and every other association which is willing to make common cause with medicine in this battle.

That's one of the top priority jobs we are going to be organizing and directing from the national campaign headquarters. But the success of that drive, in the final analysis, will depend on whether it reaches below the national level—down to the grass roots, in every state and county and city in America.

Let's set the record straight, too, on the subject of lobbying—and the smear attack that has been launched against the A.M.A. in that connection.

The charge has been made by the advocates of compulsory health insurance that the American Medical Association plans to invade Washington with a high-powered lobby and a $3,000,000 "slush fund" in an effort to block passage of the legislation in Congress.

That charge is absolutely false—and every state and county medical society, and every doctor who values the good name of medicine, should see to it that this smear attack is branded as false in every community in America.

The Washington office of the A.M.A. is one of the most modest legislative offices maintained by any of the national associations in the capital—and is staffed by men of unquestioned integrity who are highly respected in Congress.

The American Medical Association isn't embarking on any high-pressure lobbying campaign in Washington, nor is there any "slush fund." The socializers in the Office of Social Security, who have used their government facilities and government funds to lobby Congress, are simply sending up a smoke-screen against A.M.A. as a cover for their own highly questionable operations, and the people need to be told that.

The A.M.A., in its campaign, is carrying its case to the people of America in a grass roots crusade which we hope, with your help, and the help of tens of thousands of others, will reach every corner of this country.

One of the greatest rights which we have as a free people is the right of petition—and we intend to exercise that right, even though Oscar Ewing and his socializing satellites will do everything in their power to keep us from getting our story to the people. If that is lobbying, it is lobbying in the finest American tradition. The American people, not Congress, will decide this issue in the final showdown, and Mr. Ewing knows that. That's why he fears the National Education Campaign which the A.M.A. has authorized—and that's why he will do his utmost to discredit and block us.

There's another important financial policy with regard to this campaign which you should know, too—and which should be made known to every state and county medical society, as it will help to keep the record straight and let doctors know how their funds are being handled.

That policy is this:

Every dollar expended by the national campaign office will be reported in a check-by-check accounting to A.M.A. And our financial reports will be available for government inspection at any time!

That is the complete answer to the insinuations and criticisms of medicine's enemies, or political demagogues who hope to make a whipping boy of the medical profession.

TWO MAJOR OBJECTIVES

Let's consider some of the other basic policies of the campaign.

The Coordinating Committee, in approving a broad, public campaign, beamed directly to the people, rather than just to Congress, established two major objectives:

The immediate objective is the defeat of the compulsory health insurance program in Congress—and there is great urgency in that phase of the problem. The first showdown battles on compulsory health insurance may come within the next 60 or 90 days. We can't afford to be lulled into over-confidence by reports out of Washington that no serious effort will be made to push through the program at this session of Congress. That may be propaganda emanating directly from the camp of our opponents.

The long-term objective is to put a permanent stop to the agitation for compulsory health insurance—and the most vital step in achieving that objective will be an all-out campaign to enroll the American people in voluntary health insurance systems. The A.M.A.'s Coordinating Committee has authorized and directed us to conduct a nation-wide educational drive to make America health-insurance conscious—and to work with the prepaid hospital plans, the prepaid medical plans, the accident and health insurance companies and all other sound groups in the voluntary field to achieve this objective.

This is an affirmative campaign, not just a negative campaign—and I think we need to hammer home that basic point in every public appearance.

We're not just working to beat a bill. We're going to work together to resolve a problem. We're going to do something about taking the economic shock out of illness!

That's the kind of program your A.M.A. is backing—and that's the only kind of program that will eventually and finally lay the ghost of compulsory health insurance in this country.

We have already held preliminary meetings with representatives of the medical care plans and the private insurance companies to pledge them A.M.A.'s vigorous assistance in promoting voluntary health insurance—and to enlist their aid, if possible, in stepped-up selling and advertising campaigns.

I believe there are representatives in attendance here today from the medical and hospital plans and the health and accident underwriters.

In the presence of the Board of Trustees and the Coordinating Committee of the American Medical Association, I want to make this unqualified statement concerning the A.M.A.'s National Education Campaign:

The accent in this campaign is going to be on the positive. We are going to do everything in our power to acquaint the American people with the desirability and the availability of prepaid, budget-basis medical care. We believe in voluntary health insurance, not just as a political expedient, but as a sound development in medical economics. We want everybody in the health insurance field to sell insurance during the next two years as he has never sold it before—knowing that he has the prestige of the American Medical Association, and all its power and facilities, squarely behind him. And we are going to ask the doctors, when they are talking to patients who are in need of budget-basis medicine, to take time to encourage them to enroll in a good, sound voluntary health system.

That's a fundamental part of the A.M.A. program—and I hope every representative of a state society in this room will take that message home with him.

FACTS AGAINST ARTIFICE

We have an inspiring case to present in our affirmative campaign.

More than 52 million Americans already have decided that the voluntary way is the American way to cope with this problem—and have enrolled in voluntary health insurance systems.

The tremendous growth of the voluntary systems has come in a very short span of years—and has been one of the most spectacular economic developments in our time.

If there was even half the demand for compulsory health insurance in this country that exists for voluntary health insurance, Oscar Ewing and the socializers would be on the road to victory and nothing could stop them.

But the major demand for compulsory health insurance in the United States is an artificial, trumped-up demand, generated by social bureaucrats. They are leaning heavily on the false lure of something-for-nothing, and the people's fear of the cost of unexpected illness, in a desperate drive to drum up public favor for their political patent medicine.

On the other hand, American medicine and the voluntary health insurance systems already are near the half-way mark in the campaign to provide prepaid, budget-basis medicine for the American people within the normal framework of our free enterprise system.

The job is half done, but it is of urgent importance that it be completed. Every American who needs prepaid medical and hospital care should know that it is available to him. We need to take health insurance out of the luxury category—and let the people know that it can be bought economically and should be included as a necessity in the home budget, just as food and shelter and life insurance are budgeted.

The finest antidote for compulsory health insurance is voluntary health insurance—and the agitation for socialization of the medical profession will come to a halt when the majority of the people have been provided with the remedy.

That's the way we can accomplish our long-term objective—and every state and county medical society in the United States ought to become a strong ally of the insurance industry and the prepayment systems, and work with them until the final objective is achieved.

Now let's take a good, hard look at our immediate objective—the defeat of the compulsory health insurance program in Congress.

The time schedule of the opening battle in Congress we can't determine. Our opponents have that advantage—and our only safe course, regardless of the conflicting and confusing reports which will emanate from Washington, is to mobilize for all-out action now and be ready whenever the attack comes.

Our own militancy and our own readiness for a showdown may make the socializers hesitate to force the issue at this session of Congress—and may give us badly-needed time to get our long-range campaign under full steam. But we can't have any assurance of that desired development.

The fate of other bitterly controversial issues now pending in Congress may be a decisive factor in determining the tactics of our opponents. If other legislative proposals in the controlled-economy program of the Truman administration should be jammed through this Congress fairly early, we would be in real danger that the steam-roller would keep right on rolling—and in that event medicine might be engaged in a bitter battle for survival before the end of this session.

On the other hand, if Congress becomes embroiled in heated and long-drawn controversy on other issues which are ahead of compulsory health insurance on the agenda, we may have a breathing spell. Or we may find Oscar Ewing proposing a watered-down bill, hoping to disarm us with apparent moderation and get half a loaf this session with the full expectation that he will be able to get over the rest of his program later.

We can't call the shots on just how or when the battle will be joined, but we can and must get American medicine off the defensive and into an affirmative, offensive position. That's an immediate and vital necessity.

TRUTHFUL, HARD-HITTING CAMPAIGN

We have emphasized that this is going to be a sound, constructive campaign.

But let me underscore this statement:

This isn't going to be any panty-waist campaign!

The A.M.A. is going to wage a truthful, hard-hitting campaign, in language that the American people understand.

The critics of the medical profession have had their field day—and they'll continue to have it until American medicine strikes back and strikes hard.

There are going to be no punches pulled in our national publicity campaign—and we want you to know that.

We're going to attack—and attack—and attack—until the truth about the vicious consequences of political medicine are known throughout this country.

We're going to put the foes of American medicine on trial before the bar of public opinion in this nation—and let the people decide for themselves whether they want men of medicine, or medicine men, in charge of the health of their families.

We're going to expose the shameful misrepresentation, the juggled facts and garbled statistics, the phony draft rejection figures and the deliberate attempt of Patent Medicine Man Oscar Ewing to hide from the people the true cost and the social consequences of the scheme of socialized medicine which he is proposing.

That's one of the jobs we have at the head of the list in national headquarters—and we hope that all of you, in your home states, will duplicate it.

If we're going to turn the tables on the socializers, and get the medical profession into an affirmative position, there's another immediate job to be done. That's the job of mobilizing organization support for medicine's cause in agriculture, business, in industry, in the veterans' organizations, in the women's clubs, in churches and lodges—and in all the thousands of organizations which make up a cross-section of America.

The fastest way to make our influence felt in Washington is to marshal a powerful array of nation-wide organizations, representing great groups of American citizens, in opposition to compulsory health insurance.

That job is the direct responsibility of our national headquarters and the drive for specific action by hundreds of national organizations, trades and professions already has started. But we'll need lots of help from all of you in making this phase of the campaign successful.

In moving for important endorsements of medicine's position, medical leaders who have the contacts often will be called on to help open the door or close the sale.

From these major endorsements will stem much of our publicity in the early days of the campaign, designed to broaden the campaign into a great public crusade. We need allies, strong allies, whom we can convince that this is their battle just as much as ours. We need the use of their mailing facilities, space in their newsletters, house organs and magazines. We need letters and phone calls and telegrams from their members, flowing to their congressmen.

All of this requires manpower. Our small professional staff can't possibly do all the work, but we believe that we can find doctors and others who will do it. Mainly, this is the same task which confronts a military organization. The troops fight the battle, but they first have to be properly mobilized, trained and directed.

STATE AND COUNTY ACTION NEEDED

In every state and in every county there should be similar organization drives—for action by state and local organizations which help to mould public opinion. We need the impact of their support on your congressmen—and your United States senators. We want them to hear from the organizations at home, so that they know how their own constituents feel on this issue.

One of the objectives of the national headquarters will be to provide you with all the materials of war—and to lighten the financial load on the state and county societies. We will attempt to provide you with pamphlets and posters, form speeches, cartoons, mats and other supplies in any quantity you can put to good use. We hope the only limit that will be placed on the materials available to you will be the limit of your ability to get them into the hands of voters in your home states and communities.

The question has been asked whether the A.M.A. will also allocate funds to the states to help in distributing costs, or for other purposes. The answer to that question is "No," for reasons which probably require no explanation.

I want to touch briefly on another probable development in the national campaign which is still in the evolutionary process, but which you will hear about in more detail within the near future.

We have recommended that a national committee of leading citizens in all walks of life be established as auspex for an important part of the work in this campaign—a committee which we will help to organize, but which will also draw strength from many other sources.

This organization will be called the American Committee for Health Security.

Under the committee's name, on one side of the letterhead, will be the slogan: "For Voluntary Health Insurance; Against Compulsion!" On the other side, balancing this, will be a second slogan: "The Voluntary Way Is the American Way."

Some of the great, outstanding leaders of America have agreed to serve as members of this national lay committee—and we believe it will broaden our front and create a rallying place for thousands of people who have no direct connection with medicine, but who have a healthy interest in the welfare of America.

When the time comes for perfecting that organization, we may ask each of you to help recruit some of the outstanding lay leaders in your state for that committee.

PRACTICING PHYSICIANS MUST HELP

Now let's return to the most important man in this campaign—the practicing physician!

The 150,000 members of the American Medical Association must be the front line troops in this battle.

The A.M.A. and the state and county medical societies can't win this fight, but their members can.

A doctor can talk to his patients on this issue and get their earnest attention, because this is an issue that involves their health and their relationship with the doctor.

Our greatest need—and this is the most important job you will have—is to get the word to every doctor that this is an emergency, that his help is needed, and that his right to continue in private practice may depend on how he measures up to the challenge.

We need every doctor on fire on this issue . . . taking time out to talk to every leader he knows in the community, urging them to write their congressmen, stirring his patients and friends into action.

A doctor knows that political medicine is bad medicine—that it means hit-or-miss diagnosis and superficial treatment of symptoms. He knows that personal interest in the welfare of the patient suffers when assembly-line medical practice takes over. And he knows that the quality of medical care steadily deteriorates when doctors succeed or fail on the basis of political preferment, or on the number of cases they can rush through their offices in a crowded day.

No one can talk to a patient on that subject with the eloquence of his family doctor—and we simply must have that doctor at work, if this battle is to be won.

Doctors know, too, if they are familiar with what's happened in other countries, that invasion of the individual's privacy is one of the most objectionable features of compulsory health insurance. They know that the sanctity of the physician-patient relationship goes out the window when government medicine comes in.

That's a subject on which a doctor can talk convincingly—and our campaign pamphlets will provide corroborative material on that personal, compelling issue.

People talk to doctors about their financial troubles as well as their physical ills—and they'll listen to the doctor if he tells them that compulsory health insurance isn't free—that, instead, it will mean a 6 or 8 per cent payroll tax on every dollar they earn.

That's the kind of missionary work that will win this campaign—and that, more than all else, will give us a real grass roots campaign.

How the Doctor's $25 Will Be Spent

LEONE BAXTER: Every minister preaches from a text—and every campaign, if it is a successful campaign, has to have a theme.

The theme, if it is geared to reach more than 100 million people, as we must in this campaign, should have simplicity and clarity.

Most of all, it must high-point the major issues of the campaign with great brevity—in language that paints a picture understandable to people in all circumstances.

EVERY DOCTOR A CAMPAIGNER

That's one of the reasons we have a large, blown-up color reproduction of the famous Fildes painting, "The Doctor," on exhibit here today, with the simple caption under it: "KEEP POLITICS OUT OF THIS PICTURE!"

The picture and the caption, even without elaboration, focus attention on one of the most important arguments against government-controlled medicine.

Smaller color reproductions of this famous painting soon will go up in doctors' offices all over America as one of the first steps in dramatizing our case to the American people—and, more important—as the first step in making doctors campaigners in their own behalf. For this purpose we have added a hundred words of text which help to establish the theme of this campaign.

I'm going to read you that text, because it stresses, in simple language, the essential points of the case which we believe will turn the tide against compulsion and in favor of voluntary health insurance.

The text is as follows:

KEEP POLITICS OUT OF THIS PICTURE!

When the life—or health—of a loved one is at stake, hope lies in the devoted service of your doctor.

Would you change this picture?

Compulsory health insurance is political medicine. It would bring a third party—a politician—between you and your doctor. It would bind up your family's health in red tape. It would result in heavy payroll taxes—and inferior medical care for you and your family. Don't let that happen here!

You have a right to prepaid medical care — of your own choice. Ask your doctor, or your insurance man, about budget-basis health protection.

This is signed: American Medical Association.

These smaller posters will be sent under the signature of the A.M.A. to show medical men throughout the country that the Association is resolutely behind the national campaign. They will be sent to doctors only at their own request. Return postal cards will be in the mail shortly.

The dimensions of the posters are approximately 18 by 20 inches. They are dignified—but carry a strong message—stronger, we are aware, than most doctors are accustomed to display in their waiting rooms. Their final cost, including the right to reprint the famous picture, art work, stock, printing and mailing comes to about 30 cents each. If we can light the crusading fires, and tie into the campaign the majority of the doctors of this country, for the cost of 30 cents each, the results will be well worth the price!

THE REAL AMMUNITION

The major portion of the campaign budget will be spent for production of materials—the campaign ammunition. We are not going to waste any campaign funds on faulty ammunition. Any general pamphlet produced will have to be printed in minimum lots of 7,500,000—just to put 50 copies into each doctor's hands alone. To make the smallest trickle beyond that outlet to the public, we shall have to print a minimum of 10 million copies of any piece produced. That means simply that we can't afford to experiment. We can't afford to throw our next-best or divided efforts into print and hope it will suffice. What we produce must be brief enough to read—dramatic enough to create sentiment—and sound enough to produce action from the thinking people of this nation.

Some very excellent basic material had been produced by men of medicine and men close to the profession, long before the National Education Campaign was initiated — and that will give the production of the new material the most helpful impetus.

One of the pamphlets in the planning and production stage is a small, sparked-up human-interest folder to satisfy the need among doctors for a simple piece that can be given to patients, mailed with statements or placed in waiting rooms. It will be suitable as well for general use by allied professions and industries. This will be a special appeal, illustrated public pamphlet, geared to the interests of the average citizen—the veteran, the farmer, mother, businessman, wage-earner, etc.

The doctors will receive their first copy of that pamphlet direct from A.M.A. headquarters, with a brief letter, telling some of the highlights of the proposed campaign, and advising the doctors that they can get the pamphlet in quantity through their state or county medical societies.

The question-and-answer pamphlet which actually will serve as the doctor's campaign handbook, also is in process. The handbook should give every doctor not only the facts he needs to argue his case effectively, but also simple instructions on how to practice on the body politic.

The small leaflet will be a general public piece and can be distributed through many channels. The handbook, while beamed to doctors, also will be used for distribution among members of our lay committees. We believe that the dentists' associations, the druggists' organizations, the hospital associations, the medical auxiliaries and various other closely related groups should be urged to turn out similar material, or use ours under their own imprints.

We also plan to assist many cooperating national organizations—veterans' groups, for example—to produce pamphlets slanted to their own memberships, and emphasizing the arguments which will have special appeal to them.

A third pamphlet is in preparation whose title will be "Calling Every Doctor—This Is An Emergency!" This, too, will go directly to physicians, with a letter from the American Medical Association. It will be a briefly presented statement of the issue, the objectives—and the procedure to accomplish those objectives. Its purpose will be similar to that of the poster—to get every doctor who believes in the private practice of medicine working enthusiastically with his local campaign committee.

A PAMPHLET CAMPAIGN

Actually, this issue is made to order for pamphlet presentation . . . and we plan heavy use of pamphlets, running into many millions of copies, to tell medicine's story dramatically and effectively both to leaders of public opinion and to rank and file citizens throughout the country.

With new developments and changing conditions in the campaign, there likely will be need for frequent revision of the text of early pamphlets, or the production of entirely new material. As a consequence, a heavy load will fall on our writing and production department, and one of the first problems, of course, is to produce copy fast enough to satisfy the press, A.M.A. members, state and county societies and the literally hundreds of business and civic groups which all require special servicing.

Above all, the written material in this campaign must be emotional, fighting prose. We can't win an audience with dry, statistical copy. We have to give the people facts, but in very readable form. The surest way to break down apathy and public disinterest is to turn out copy that stirs the emotions—and, in doing so, opens closed minds.

It is vital, too, that much of this flow of words should reach the people through normal newspaper and magazine channels, rather than through direct publicity releases. We intend to work with the great newspapers and the national magazines to get them to do special jobs, with real reader interest, and that work already is well started. The story of British medical practice today, as an example, is actually one of the most important stories of this era. The A.M.A. already had started the wheels moving to get the truth and publicize it before this campaign began. It is a story which must be told and re-told by staff writers of American magazines and newspapers.

Once it has been printed in a magazine or newspaper of national importance, reprints of the article will be placed in the hands of key people throughout the country.

ORGANIZATION PHASES

There are two distinct phases of organization activity planned.

First is the plan of organization and operation for medical groups, which involves the relationship of the state and county societies to the A.M.A. in the conduct of the campaign. This calls for a definite division of work, with fixed responsibility in each area, so that a vigorous grass roots campaign can be developed.

Second is the plan for mobilizing the strength of the major public organizations, local, state and national—groups like the farm organizations, the more powerful business and civic associations, fraternal, religious and veterans' organizations.

The program with respect to the medical organization structure has been discussed carefully with the Campaign Coordinating Committee members in order to reach practical and intelligent decisions. The job must be done with as little friction as possible, so that doctors in the field will be directing their energies to winning converts, and their fire to the opposition. It is usually difficult to get 150,000 individualists (and most doctors are individualists) to agree on anything, but if ever the members of the medical profession needed to pull together, this is the time.

STATE MEETINGS

A number of states have reported that within the next 30 to 60 days after the National Meeting of State Representatives (February 12, in Chicago), they are calling meetings of county society representatives in their own states, for the purpose of passing along to them the national plan of campaign, and determining on their own procedures in relation to it.

Accordingly, for their help and guidance at this time, we will chart some of the important work which needs to be done within the states.

COUNTY SOCIETY ACTION

1. Every county medical society in the United States should adopt a strong resolution against compulsory health insurance within the next 60 days—and should then direct the president of the society to communicate its action, by letter or telegram, to the congressman (or congressmen) representing the district; also to the state's two United States senators. The society's resolution should emphasize the inevitable deterioration of medical care and the danger to the public health, once government medicine is in operation, and should stress the tremendous growth of the voluntary systems and that the American people are taking care of the problem in the American way. The president's letter to the congressman or senator should ask for a reply, so that the legislator's position can be made known to the doctors of his district. Copies of all replies should be forwarded to the national campaign offices and to the Washington office of A.M.A. as rapidly as they are received. We will provide several form resolutions as a guide to the societies.

The combined political strength of all the doctors in a congressional district is impressive—and we need to put every congressman on notice of the position taken by his doctor constituents.

LAWMAKERS' DOCTORS

2. We need to locate the personal physician of every congressman and every United States senator (the county society secretary probably should take on that job) and have him send a personal letter to his patient, the congressman, telling him of the danger of socialized medicine, and asking for his help in defeating any compulsory health insurance program which may be submitted. We will provide form letters, but the society secretary should help the doctor, if necessary, in rewriting and personalizing the letter in each instance. This letter also should ask for a reply—and again, the information in the replies should be sent to the National Campaign office and the A.M.A. Washington office.

SPEAKERS' BUREAUS

3. We need an active speakers' committee in every county society to cover local meetings. The executive secretary of each of the state societies should aid in organizing this work. We will provide form speeches, but in many cases they will need to be localized to meet local conditions.

One of the very great requirements is for every state to develop top bracket speakers, both in the profession and apart from it, who can be called on for important meetings, both state and national.

DEBATES

We do not believe it a sound campaign practice to sponsor too many debates. They make a forum for the opposition which would be difficult for them to secure otherwise, and they are too easily stacked. This is particularly true of broadcasts of debates open to the public. Our speakers will stick to the facts. But already in this campaign, the opposition has begun to use the facts very loosely. Their claques in the audiences are briefed to applaud wildly every trick phrase their speaker utters. And the public has no way of knowing which is fact and which is fancy. If our case were so poor that we had to stack meetings, it would not be worth the effort we shall all put into this campaign.

PRESS COMMITTEE

4. We need a press committee in every county society to make personal calls on the editors of all newspapers in the county and urge their support of medicine's position. This work, again, should be coordinated by the state society.

ENDORSEMENT DRIVE

5. Since our first objective is making the position of the people on this issue known and recognized by our representatives in Congress, much of our first campaign effort must continue to be devoted to getting organizations on record in opposition to compulsory health insurance.

In this connection, one of the first mailings from the national campaign headquarters to the states will be a list of conventions scheduled in each state during 1949. This is not to be considered a complete list, but we sincerely hope it will be helpful in beginning the drive for resolutions in your area. It will include all conventions reported at this early time; you will need to add to it as others are scheduled. The list will contain the following information:

Name of organization
Town where convention is scheduled
Estimated attendance
Person to contact, to our best knowledge
Whether convention is national, state or local.

Some organizations on the list may have a policy of not taking action on public issues, or will profess "no interest." When an issue is of fundamental importance, as ours is, however, and when somebody takes the time to explain the honest facts and drive for a resolution, virtually all the important organizations do take action.

As fast as they are produced, form speeches geared to different types of audiences will come along to you; also suggested form resolutions which can be localized or particularized as you see fit; also the question-and-answer pamphlet providing brief, factual answers to the most commonly asked questions concerning the issue of compulsory health insurance. Armed with this material, a good speaker will have little trouble making a splendid, positive case before even a difficult group.

ENDORSEMENTS . . . PROCEDURE

Since the value of formal action from any group is in exact proportion to the work done to capitalize on it, these are some of the things which must be done, once a good resolution is in your hands:

If it is from a strong, statewide organization you should send copies of the resolution first thing to:

Your two United States senators
Your congressmen
Your state legislators
The A.M.A. office at 1302 18th St. N.W., Washington, D. C.
The National Campaign Headquarters, 1 North La Salle, Chicago.

Every county medical society, immediately it has acted, should send copies of its resolution to:

Its two United States senators
Congressmen from its own district
State legislators from its own district
Its state campaign chairmen at the state medical association office
The A.M.A. Office at 1302 18th St., N. W., Washington, D. C.
The National Campaign Headquarters, 1 North La Salle, Chicago.

Action of other county or city organizations should be reported to United States senators only when deemed of sufficient importance to merit such handling, but should be reported at once to all others listed above.

Resolutions sent to all congressmen should be accompanied by covering letters asking for a reply, in order to keep advised, if possible, of the position of your legislative representatives.

Originals of all resolutions should be kept in the originating office, unless otherwise requested.

Copies of resolutions should reach the press and radio on the same day action is taken if possible, through your state or county publicity channels, as determined by your campaign chairman.

When an organization has acted, it should really be asked to go to work in the campaign:

a. Getting literature to its membership, either through meetings or by use of its mailing list, or both.

b. Using its house organ or news letter for both news and editorials on the issue.

c. Offering its talented members as volunteer speakers on the issue of compulsory health insurance.

d. (Members on record in one organization can help, too, in presenting resolutions to other organizations of which they are members, and helping to steer them to favorable conclusions.)

Most of the state medical associations have working organizations long in existence and thoroughly ready and able to handle their part in the campaign.

6. Machinery will have to be set up in the few states where it is not already operating, probably under the direction of the state society office, to see that shipments of materials from the national headquarters actually get into doctors' offices and finally into the hands of doctors' patients.

It is important to name the person, presumably in your state association office, to whom the national headquarters will channel supplies of literature and other materials for fast distribution in your state. His name, address, and telephone number should be sent at once to the national campaign headquarters.

In some states it may be desired that supplies go direct to the county society offices. However, it is the feeling of the national campaign directors that campaign materials in general should channel through the state medical association machinery, and down to the county societies under the directives of the state itself. That, we believe, should be determined within each state.

AUXILIARIES ARE EFFECTIVE

Obviously, the women's auxiliaries of the medical societies will be able to carry a big share of the load. As some of the California representatives will tell you, in that state's campaign on the issue of compulsory health insurance the women accomplished some of the most effective work done in speaking before women's organizations, in literature distribution, in securing endorsements and in keeping the club and women's editors enthusiastic on the issue.

COMMITTEES

It is important within the states to organize committees of doctors, both on the state and county basis, who are able to give their time to the campaign objectives, to handling speaking engagements and to working on endorsements.

Laymen may be added to committees as time goes along, as the work gets heavier and as laymen become more interested in the issue. (Committees should be kept close-knit, however, and controlled by the profession's own chairman.) In any case, help from leaders outside the medical profession should be sought and welcomed. Not only will such aid lighten the load on doctors, but it will help build the broad public picture of the danger in socialized medicine to every element of our national life.

CONCLUSION

We recognize that A.M.A.'s permanent staff, headed by Dr. Lull, has a full load of work in just maintaining its normal activities. We will need a tremendous amount of help from them, however, and we have had many warm assurances of their desire to be in the front lines of the battle, as they have been for years past.

We visualize that they will serve in many capacities, giving the national campaign the aid of their counsel and guidance, as required, providing the background material and the knowledge of the vast medical organization which we so badly need, flying into key states to carry the message, maintaining lines of communication with all the state and county societies, opening doors everywhere that are vital to the success of medicine's campaign.

The Public Relations Department of the A.M.A., under the very capable hands of Larry Rember and his staff, is going to have a tremendous task to perform. Its work will be vastly heavier as a direct result of the campaign. The states, incidentally, probably will see more of Mr. Rember, Mr. Bach and Mr. Doscher than ever in the past, for part of their work will be "trouble-shooting" in areas where the campaign at one time or another may bog down and require a jet-propulsion assist.

Their work will coordinate closely with the national campaign and in many respects will overlap it.

They will make an intensified, affirmative campaign to drive home to the public the vital part the medical profession plays in the lives and the health of Americans. They will intensify their efforts to interpret factually—and dramatically—the work of the departments of the A.M.A.—work that daily reflects highest credit on the profession and which has made the entire world deeply respectful of the American Medical Association.

We are confident that the campaign which has been laid out is a practical, workable, effective campaign, and will produce the results we must have. We are confident that by working together we can win the fight against government-controlled medicine—and that when the fight is over, medicine will have pointed the way for the whole nation, at a time when the nation might easily travel either road—toward a controlled economy or toward a free economy.

We sincerely believe that the individual doctors throughout the nation, who have paid $25 each to tell their story to America, will feel proud, as the story unfolds toward its conclusion—proud of their part in writing one of the greatest and most significant sagas of American history.

In Memoriam

Guilfoil, James Anthony. Died in San Francisco, March 7, 1949, aged 61, of a heart attack. Graduate of the University of Michigan Medical School, Ann Arbor, 1911. Licensed in California in 1912. Dr. Guilfoil was a member of the San Francisco County Medical Association, the California Medical Association, and the American Medical Association.

✣

Kay, Milton M. Died in National City, November 16, 1948, aged 76, of sprue. Graduate of Northwestern University Medical School, Chicago, 1905. Licensed in California in 1905. Dr. Kay was a member of the Kern County Medical Society, the California Medical Association, and the American Medical Association.

✣

Norton, Frank L. Died in Los Angeles, March 14, 1949, aged 82. Graduate of the University of Southern California Medical School, Los Angeles, 1901. Licensed in California in 1901. Dr. Norton was a retired member of the Los Angeles County Medical Association and the California Medical Association.

✣

Sippy, John J. Died in Stockton, March 15, 1949, aged 69, of chronic myocarditis. Graduate of St. Louis College of Physicians and Surgeons, 1899. Licensed in California in 1923. Dr. Sippy was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

Vercellini, Charles H. E. Died in Los Angeles, December 22, 1948, aged 70. Graduate of Regià Universita di Torino. Facoltà di Medicina e Chirurgia, 1901. Licensed in California in 1945. Dr. Vercellini was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

Wolfe, Homer Holsinger. Died in Fort Bragg, March 3, 1949, aged 65, of a heart attack. Graduate of Cooper Medical College, San Francisco, 1909. Licensed in California in 1909. Dr. Wolfe was a member of the Mendocino-Lake County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

John Johnson Sippy

John Johnson Sippy died in Stockton, California, March 15, 1949, after several months of failing health. Doctor Sippy was born in Venice, Illinois, July 13, 1879, and became one of America's most outstanding public health administrators. Graduating from the St. Louis College of Physicians and Surgeons at the age of 20, he located his practice in Belle Plain, Kansas. He continued this general practice for 14 years, the last five of which he also served as the part-time public health officer of Sumner County. The year after this appointment he was elected secretary of the Kansas State Health Officers Association, a post in which he continued until he left Kansas in 1919. This work in public health became increasingly challenging to him and in 1913 he dedicated his career to full-time public health work. He became epidemiologist for the Kansas State Health Department and in 1919 moved to Montana as epidemiologist for that state. In 1922 he became Montana's director of child welfare.

In 1923, as a result of serious diphtheria epidemics, San Joaquin County organized the first local health district in California. To head this unique organization, its board of trustees sought a man of vision and pioneering spirit. No more fortunate choice could have been made than John Sippy. During the next quarter century he made that local health district preeminent in our nation, both in health and in principle. He stood staunchly for grass-roots principles, local responsibility. He commanded the respect and admiration of his medical colleagues, serving as president of the San Joaquin County Medical Society for two full terms. Recognition was given him by his fellow public health specialists in the form of election to many important positions, and from 1944 to 1946 he occupied the highest elective position in American public health, the presidency of the American Public Health Association.

John Sippy recognized the responsibility of public health leaders in sharing their knowledge. From 1916 to 1919 he was lecturer in communicable diseases at the University of Kansas. In 1934 he became associate clinical professor of public health and preventive medicine at Stanford University School of Medicine. Despite the distance from his own community, he journeyed regularly to San Francisco in the teaching of medical students and to enrich their appreciation of the worth of full-time health departments and health officers. Quiet and unassuming, he was as beloved as a father or brother. But he was known, too, as utterly fearless. He cherished the highest ideals of medicine with uncompromising integrity. The inspiration he left is as priceless as the thousands of lives he saved.

Frederic Morris Loomis

Through the printed word, Frederic Morris Loomis, physician and author who died last February at the age of 71, was renowned throughout the world, but nowise and nowhere was he more favorably known than as a physician in the circle of his colleagues and his patients.

He achieved the degree Doctor of Medicine in the fact of greater than usual obstacles and later in life than most students. Dr. Loomis recorded in his writings that he knew, even in his early years, that most of all he wanted to be a physician. Lack of money forced him to relinquish a premedical education before it was well begun. To supply the immediate need he went to Alaska where he worked as a miner more years than he had intended, then for a time as editor of a newspaper in Ketchikan. But the call to medicine was strong and he returned at last to the University of Michigan. He was graduated from the school of medicine there in 1912, a doctor only beginning his career at the age of 35. After four years as an instructor in obstetrics and gynecology at the university medical school, he moved to Oakland, California, and there established himself in private practice.

The glow of the ideal of physician-patient relationship was reflected ultimately in two of Dr. Loomis' best-known books, first in "Consultation Room," and then in "The Bond Between Us," written in the reflective years after he had retired from practice.

A measure of the place he held in the esteem of those who knew him best is given by Dr. Fletcher Taylor, writing in the *Bulletin of the Alameda County Medical Association:*

"His fame as a man of the world will take care of itself. His fame with us is personal. We are the privileged who knew the man who was a miner in order to become a doctor, and a doctor before he became a writer.

"So we are saddened for ourselves in this fateful loss and we truly grieve with his family, so effective in their adoring efforts in his behalf. And though we mourn, there will always live for us the inspiration of the life and works and friendship of Frederic Morris Loomis."

* * *

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Herrick Memorial Hospital of Berkeley has been **approved for training of residents** in pathology by the American Medical Association's Council of Medical Education and Hospitals and the American Board of Pathology, according to a recent announcement by the hospital. This is the fourth resident training program given official approval. the hospital announced, the others being surgery, obstetrics and gynecology, and psychiatry.

LOS ANGELES

Dr. Lewis E. Scharf last month was appointed acting health officer in charge of the Glendale district office of the Los Angeles County Health Department. Dr. Scharf takes the place of **Dr. Myron W. Husband**, who resigned to accept appointment as health officer of Humboldt County.

* * *

Cooperating with the Los Angeles County Medical Association, the Los Angeles County Tuberculosis and Health Association is now conducting a six-month demonstration **program to encourage use of the chest x-ray** by physicians. The program, which opened April 18, has two purposes: the finding of unsuspected cases of tuberculosis, heart disease and other chest abnormalities, and the education of physicians in the routine use of the chest x-ray.

X-ray films are made only when the patient is referred to the unit on one of the prescription forms which were furnished each member of the Medical Association by the tuberculosis association. Patients are not accepted if they are being treated for chest symptoms for which an x-ray would normally be ordered, since the program calls for examination of those for whom a film would not be required in the routine course of diagnosis. Each film is read separately by a qualified radiologist and a chest specialist and the findings are mailed to the physician making the referral.

The free service is **limited to members of the Medical Association** or those qualified for membership. The 70 mm. portable minifilm unit is housed in Medical Association quarters for the demonstration period.

PLUMAS

Dr. Paul A. Lum, formerly in general practice in Contra Costa County, has been appointed county physician of Plumas County and superintendent of the county hospital at Quincy.

SACRAMENTO

Dr. Louis Jones of Roseville has been appointed by Governor Warren to the State Board of Medical Examiners, succeeding **Dr. Richard O. Bullis,** Los Angeles, resigned. Dr. Jones was appointed for the term ending January 15, 1953, and **Dr. Frederick N. Scatena** of Sacramento, incumbent secretary of the board, was reappointed for a similar term.

SAN FRANCISCO

Grants-in-aid to support **research in the field of heart disease** were awarded recently by the Insurance Medical Research Fund to four physicians at the University of California Medical School, two at Stanford University School of Medicine and one at Mt. Zion Hospital, San Francisco. The awards were as follows:

Dr. David M. Greenberg, University of California Medical School, for research on metabolic changes in the kidneys and arteries associated with the development of hypertension and arteriosclerosis, $15,750.

Dr. John H. Lawrence and Dr. William J. Kerr, University of California Medical School, for research on vascular physiology and disease, with special reference to total body water, $13,650.

Dr. I. L. Shaikoff, University of California Medical School, for research on the metabolic characteristics of arterial tissues and the pathogenesis of arteriosclerosis, $8,400.

Dr. J. M. Crimson, Stanford University Medical School, for research on capillary blood flow, $12,600.

Dr. Emile Holman, Stanford University Medical School, for research on experimental valvular disease, cardiac anastomoses and hemodynamics, $5,250.

Dr. Meyer Friedman, Mount Zion Hospital, for research on the distribution and fate of digitalis glucosides, $16,800.

* * *

The University of California Medical School, University Extension, has announced two additional **postgraduate courses for the summer months,** one a five-day course in endocrinology, the other a six-day course in the medical aspects of nuclear energy. The former will be held June 20 through June 24 and the latter August 29 through September 3.

Further information may be had from Stacy R. Mettier, M.D., head of postgraduate instruction, Medical Extension, University of California Medical Center, San Francisco 22.

GENERAL

A new film, titled **"Cancer: The Problem of Early Diagnosis,"** which has received the approval of the American Medical Association's Committee on Medical Motion Pictures, has been made available to the medical profession through more than 50 state and regional distributing points. Through the efforts of its co-sponsors, the American Cancer Society and the National Cancer Institute of the United States Public Health Service, prints for single showings may be borrowed from state cancer society offices, state health departments, and four regional offices of Association Films located in New York City, Chicago, Dallas, and San Francisco.

The film, designed for general practitioners, is based on the premise that if cancer were diagnosed early and effectively treated the death rate might be reduced by almost 50 per cent.

* * *

Two California medical schools were among recipients of **grants-in-aid of research** announced recently by the American Heart Association. One grant went to the University of California School of Medicine for studies of the effect of drugs on cardiac metabolism, under the supervision of Dr. C. H. Thienes; the other to Stanford University School of Medicine for study of edema in congestive heart failure and the effects of diuretic agents, under the supervision of Dr. David A. Rytand.

Dr. Lawrence Kolb, medical director of California state hospitals, last month was appointed to serve as acting director of the State Department of Mental Hygiene to fill the vacancy caused when Mrs. Dora Shaw Heffner resigned the post because of ill health. Dr. Kolb was appointed to serve until a committee composed of the deans of California's five medical schools, which was appointed by Governor Warren to find "the most competent administrator available" for the post, finishes its survey and brings in its recommendation.

* * *

The first meeting of the newly formed **International Academy of Proctology** will be held in Atlantic City, N. J., June 10, 1949. The scientific portion of the program will consist of the presentation of papers and motion picture films of interest to all physicians as well as to those specializing in proctology. Further information and a copy of the program may be obtained by writing to Dr. Alfred J. Cantor, International Academy of Proctology, 43-55 Kissena Blvd., Flushing, N. Y.

* * *

Establishment of a **National Institute of Mental Health** to intensify efforts toward the prevention, control and treatment of mental illness was announced recently by Surgeon General Leonard A. Scheele of the U. S. Public Health Service. Research will be carried on outside of the Public Health Service through research grants and fellowships awarded to non-Federal research institutions and individual scientists. Training of personnel and the establishment of community mental health facilities also will be assisted through grants-in-aid.

Despite the nation-wide shortage of professional personnel, mental health programs have been initiated in 27 states and territories and have been expanded in 24 others since passage of the Mental Health Act.

* * *

At a recent convention in San Francisco of the **California Society of Anesthesiologists,** which was formed a year ago as a merger of similar organizations in Northern and Southern California, Dr. Forrest E. Leffingwell of San Marino was elected president, succeeding Dr. Charles F. McCuskey of Los Angeles. Dr. Fenimore Davis of Oakland succeeded Dr. Thorne Hopkins of Fresno as vice-president, and Dr. Bruce M. Anderson of Oakland was reelected secretary.

* * *

The Fifth National Conference of County Medical Society Officers (Grass Roots Conference) will be held in Atlantic City, Sunday, June 5. This is the day prior to the opening of the A.M.A. House of Delegates. Morning and evening sessions will be held. The morning session will be devoted to specific county medical society problems, with panel discussions on: (1) The problem of emergency calls; (2) Indigent medical care plans; (3) The National Education Campaign. The last hour of the morning session will be given over to questions on the National Education Campaign, with Mr. Clem Whitaker and Miss Leone Baxter, campaign directors, present to provide the answers. The evening session, which will be open to all physicians and their wives, will feature talks by Mr. Whitaker and the Honorable John L. McClellan, U. S. Senator from Arkansas.

* * *

Examinations of candidates for the position of **Chief of the Bureau of Hospitals** in the California Department of Public Health will be held June 25, 1949, by the State Personnel Board. The deadline for filing of applications to take the examination is June 4. Examinations for the position, which carries with it a salary range of $644 to $782 a month, will be held in Sacramento, San Francisco, Los Angeles and in "such other places in California and other states as the numbers of candidates warrant and conditions permit."

Scheduled for June 21, 1949, are examinations of applicants for the position of **Assistant Medical Director,** Industrial Accident Commission, for which the salary range is $530 to $644 a month. The closing date for the filing of applications is May 31, and the places of examination are the same as those designated for the candidates for Chief of the Bureau of Hospitals.

Full description of the requirements for both positions may be had from the State Personnel Board in Sacramento, San Francisco and Los Angeles, or at any local Department of Employment office.

Discussion of **compulsory plans for medical care** and for disability compensation will highlight the fifth annual meeting of the Conference of Presidents and officers of State Medical Associations to be held at Atlantic City on Sunday afternoon, June 5, the day preceding the opening of the A.M.A. general sessions. The meeting will be open to all physicians.

Cecil Palmer, English publisher, author, and journalist, will tell of the impact of socialized medicine on the British doctor and his patients. Palmer, now completing a tour of America, has been a brilliant spokesman for the British Society for Individual Freedom. An American viewpoint of the British health system will be given by W. Alan Richardson, editor of *Medical Economics*, who recently went to England for a first-hand study of all phases of the program.

With compulsory disability compensation programs operating in three states, and Washington and New York the latest to pass such laws, the conference presents two speakers on this vital question. Edward H. O'Connor, managing director of the Insurance Economics Society of America, will discuss the legislations, and Dr. Bert S. Thomas, medical director of the California program, will tell of the medical implications of cash sickness compensation acts.

The A.M.A. relationship to the state societies will be reviewed by Dr. George F. Lull, secretary of the A.M.A. and The Problems Facing the State Association at the Crossroads will be the subject of a talk by Dr. Clarence Northcutt, president of the Oklahoma State Medical Association. Plans are pending for the presentation of views on national health legislation by a member of Congress.

INFORMATION

Department of Public Health

Bureau of Food and Drug Inspections Statement Concerning Lithium Chloride

When lithium chloride was first proposed for use as a salt substitute, the Food and Drug Administration started pharmacological experiments to determine its safety and recommended that manufacturers likewise check the safety of the product before marketing it. Experiments in our laboratories recently showed that lithium chloride is toxic to animals. However, a large manufacturer of a lithium chloride-containing salt substitute reported that extensive clinical experiments sponsored by him showed lithium chloride to be safe for human beings, thus casting some doubt upon the applicability of animal experiments to humans.

Recently, untoward reactions in humans consuming Westsal which may have been due to lithium chloride came to our attention, and recall of lithium chloride preparations was suggested to and inaugurated by manufacturers.

On Friday, February 18, the Food and Drug Administration learned of deaths attributed to lithium chloride and public announcements of the dangers of lithium chloride were distributed immediately.

Inquiries from consumers show that salt substitutes containing lithium chloride were being used by many individuals on the advice of doctors who understood that the substitutes were harmless. At the time of the radio and newspaper publicity, these consumers in large measure had not heard of the dangers accompanying use of lithium chloride.

Consumers who have been using a lithium chloride-containing salt substitute should discontinue use immediately. If symptoms of lithium poisoning have not appeared, it is likely there will be no damage. Medical reports show that people who suffered mild symptoms of poisoning recovered when they discontinued use of lithium chloride.

In case of severe symptoms, the physician should be consulted immediately. It has been suggested that cautious intravenous administration of sodium chloride solution may be of value in treating poisoning from lithium chloride.

The symptoms of lithium chloride poisoning are drowsiness, weakness, loss of appetite, nausea, tremors of the extremities, blurring of vision and coma. Products containing lithium chloride are usually sold in drug stores and/or health food stores, and every effort should be made to remove these products from the market, notifying the dealer to contact the wholesaler and/or distributor from whom these products were purchased so that they may be returned for credit.

The brands on the California market containing lithium chloride as an ingredient are:

Westsal and *Wes-sal*—Manufactured by Westwood Pharmaceuticals, Division of Foster Milburn, Buffalo, New York.

Milosal—Louis Milani Foods, Inc., 4058 South Walker Avenue, Maywood, California.

Foodsal—Foods Plus, Inc., New York, N. Y.

Saltisal and *Salti-salt*—Lueth's Bakery, Kansas City, Missouri.

Neocurtasal—Winthrop Chemical Company, New York, N. Y. *Only Neocurtasal which is sold to food industries such as bakery and cracker manufacturers in containers of 25 pounds or larger, said product containing lithium chloride.* Note: Neocurtasal sold over the counter and on prescription and in health food stores, which contains potassium chloride, ammonium chloride, starch, potassium formate, calcium formate, and magnesium citrate, is not involved in this investigation and should not be removed from the market.

Attention should also be called to the fact that there may be other salt substitute products on the market containing lithium chloride.

It has come to our attention that some consumers believe some brands of ordinary table salt are causing these injuries. Lithium chloride is marketed as a liquid. The granular table salt, sodium chloride, is not under suspicion.

Hospitals, drug stores, dealers and health food stores should be instructed to return the above brands of salt substitutes containing lithium chloride to the distributor, obtaining a receipt for the same.

Dried Plasma Surplus Exhausted

The State Department of Public Health has been advised by the American Red Cross that the surplus supply of dried plasma is now exhausted and that the distribution by the Red Cross to the civilian medical practice has been discontinued. When current stocks in health departments and hospitals have been used the State Department of Public Health will therefore not be able to replenish these stocks.

In October 1946 the American Red Cross made this biologic surplus to the need of the armed forces available to the civilian physicians. The Division of Laboratories of the State Department of Public Health undertook the distribution to the local health officers who in turn dispensed the plasma to their local physicians. Since the inauguration of the program over 70.000 units have been distributed.

Damage Action Against Municipality Based on Poliomyelitis Infection From Sewage

In trial of an action for damages of $100,000 brought against the City of Mill Valley, Marin County, by the parents of a minor child who was alleged to have contracted poliomyelitis from sewage that backed up into the child's residence, the jury brought in a verdict in favor of the defendant municipality. The suit is believed to be the first in California based on an allegation that the disease was caused by exposure to sewage.

As the child in whose name the action was brought was one of 11 persons in Mill Valley who had the disease during the epidemic of 1945, the trial was seen as one of far-reaching implications, and appeal by the municipality in event the verdict had been unfavorable was considered a certainty.

Judge Edward Butler, who presided over the Marin County Superior Court in which the case was tried, had denied a motion by the defendant that the action be dismissed for lack of evidence and precedent. In denying the motion the court ruled that the case was of such importance as a test that it should be decided by a jury.

There was testimony for the plaintiff that on several occasions sewage had backed up into the basement of his residence and that after the floor was cleaned he had played with toys there. It was contended that as a result he had contracted poliomyelitis May 26, 1945. Testimony as to whether the sewage had spread upon the basement floor in the last week in April or, as the city contended, in January and February of 1945, was conflicting. Evidence was also introduced that fecal matter was seen on the streets and in an adjacent creek, but the exact time was not shown, nor the proximate cause.

Several clinicians testified for the plaintiff and three epidemiologists and clinicians for the defense. Among the expert witnesses for the defense was Dr. William McD. Hammond, professor of epidemiology at the University of California Medical School. Dr. Hammond had studied the Mill Valley outbreak from the start, observing patients clinically, obtaining histories and securing virus specimens. His testimony, in effect, ruled out sewage as the source of infection and gave person-to-person spread, directly or indirectly, as the most likely cause.

Plaintiff's motion for a new trial was denied.

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BOOK REVIEWS

TREATISE ON SURGICAL INFECTIONS. By Frank Lamont Meleney, M.D., Associate Professor of Clinical Surgery, College of Physicians and Surgeons, Columbia University; Associate Visiting Surgeon, Presbyterian Hospital, New York. Oxford Medical Publications, Oxford University Press, New York, 1948. $12.00.

This volume represents the observation of a keen student of both bacteriology and surgery over a busy 25 years of active practice. As the author mentions in the preface, the advent of the sulfonamides in 1935 and later World War II postponed the publication of this work and, of course, greatly changed and augmented this study.

The purposes of the book, as stated by the author, are threefold: (1) To maintain high standards of sterile technique; (2) to elucidate the bacteriological problems of surgery; and (3) to describe the natural course of surgical infections with and without surgical procedure and their therapeutic aids.

Of interest is a foreword written in 1940 by Hans Zinsser, who read the first draft of the manuscript.

The first eight chapters are devoted to the study and maintenance of sterile technique. The next four carry out the second purpose of the book, namely the elucidation of bacteriological problems. The remainder of the work is devoted to the third purpose, as outlined above.

Of particular interest are the chapters on the uses of zinc peroxide and bacteriophage in active therapy of infection. The latter is chiefly of academic interest, and at least to date there is but little clinical application that is feasible.

As might be expected because of the rapidly changing picture of antibiotic therapy, the last chapter devoted to this subject is the least up-to-date and probably even misleading. Two cases are cited, one of anaerobic cellulitis of the arm and one of gas gangrene of the abdominal wall, in which the patient died despite penicillin and surgical incision. It should be noted that the total dosages of penicillin amounted to 280,000 units and 175,000 units, respectively. These doses are known now to be far too small, and in no way should these cases be used to illustrate the questionable value of penicillin in anaerobic infection.

The value of such a volume to the individual surgeon is of some question. Its place will probably be as a reference book in a well-equipped medical school library or the libraries of the larger hospitals.

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THE PHYSIOLOGY OF THE EYE. By Hugh Davson, D.Sc. (Lond.), Honorary Research Associate, University College, London. 301 Illustrations. The Blakiston Company, Philadelphia, Pa., 1949.

This book, written by a former Canadian professor of physiology, who has had experience in teaching in ophthalmology, fills a long-felt need.

Following a description of the anatomy of the eye the book is divided into five sections which have the following titles: Intraocular Dynamics and the Transparent Tissues; The Mechanism of Vision; The Muscular Mechanisms; Visual Perception; and Optics.

The sections discuss the important parts of the subject without overwhelming the student with too much theory or too much detail. One of the subjects that has always been troublesome to the student of ophthalmology has been optics. As the author states, "The ophthalmologist is not concerned with formulae and still less with their mathematical derivation; he must understand sufficient of the general principles to enable him to speak intelligibly on the subject to the optician." With this in mind the author has cut the formulae to a minimum and illustrates the text with clear, easily-understood diagrams.

The book is an excellent one and has already been adopted as the textbook on physiology in one of our well-known postgraduate courses in ophthalmology.

The format is excellent, the print being very readable and the illustrations being clean-cut and well printed. The book was printed in Great Britain and bound in this country.

The book can be recommended as an excellent text on the physiology of the eye for the student of ophthalmology, particularly the resident in ophthalmology.

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PSYCHODYNAMICS AND THE ALLERGIC PATIENT. By Harold A. Abramson, M.D., Associate Physician for Allergy, The Mount Sinai Hospital, New York, N. Y. A Panel Discussion. The Bruce Publishing Company, St. Paul and Minneapolis, 1948, for the American College of Allergists, 423 LaSalle Medical Bldg., Minneapolis 2, Minn.

Dr. Abramson has combined in an 85-page book two of his articles on the psychologic aspects of allergic manifestations, with a panel discussion by a number of internists, allergists and psychiatrists. The author "hopes that this first step in the coordination of organizational allergy and psychodynamics will lead to the ultimate recognition of the importance of emotional factors in the routine therapy of the allergic patient by both the allergist and the general practitioner."

In the first section, Dr. Abramson reveals briefly the early psychologic explanations for asthma and rhinitis by quotations from various authors from Hippocrates to Mackenzie in 1887 and Thorowgood in 1879.

In the second section the author finds himself at a loss to always explain or completely correlate his patients' symptoms by use of the immunologic model. He thus gives brief summaries from his patients' records in which he believes factors of emotion seem to play a major part. It is emphasized by Dr. Frank Fremont-Smith that the author has every right to do this, as he has gained respectability by having done important work on physicochemical mechanisms connected with immunologic processes in allergy.

In the panel discussion Drs. Frank Fremont-Smith, Edward Weiss, Hal Davison, Sandor Rado, O. Spurgeon English, M. Murray Peshkin, John A. P. Millet and John H. Mitchell ably discuss the importance of psychodynamic factors. They are in agreement that these play important roles in the symptoms of asthma, rhinitis and urticaria.

Drs. Leon Unger and George L. Waldbott commented on the dangers of attributing all unknows to psychic factors while Rudolf L. Baer, principally interested in allergic dermatoses, stated that he had never seen a case of urticaria, atopic dermatitis or eczema in which a psychic factor could have been a major cause. He did admit that psychic factors may contribute through the autonomic nervous system.

It is admirable that several of the speakers had the temerity to admit that actually little is known, for example, about the detail of the mechanisms involved in asthma on the one hand and the neuroses on the other.

Dr. Smith brought out that the very respectable physicists no longer think of single causality and Dr. Abramson concludes that allergy and psychiatry should now be synthesized by the clinician in theory and practice.

In the opinion of the reviewer this book should be read with respect and interest by those dealing with these syndromes, but because of the multiple factors involved in many such problems a great humility should be practiced by both psychiatrists and others in relation to etiology.

Many of us have long ago accepted the value of psychotherapy, and a book such as this seems rather behind the times. However, its essential good is that we now may feel officially released from the restrictions implied by the frame of reference of immunology and should simply believe that if therapy by any procedure is efficiently successful, both for relief and prevention of symptoms, it should be used, even though essential explanations may eventually come through electrochemistry at the other end of the neuron.

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PSYCHIATRY IN GENERAL PRACTICE. By Melvin W. Thorner, M.D., D.Sc., Assistant Professor of Neurology, Graduate School of Medicine, University of Pennsylvania. 659 pages. W. B. Saunders Company, Philadelphia. 1948. $8.00.

This volume was written primarily for the use of general practitioners and students in order "to acquaint the internist and general practitioner with those aspects of psychiatric theory and practice which are of constant daily concern to him." After a preliminary few pages on the plan of the book, the second section deals with "The People," more or less typical kinds of psychiatric patients. There is a chapter on intelligent people, with above-average intelligence, in whom emotional problems interfere with adequate functioning, and another chapter on "Dull People," about those whose lack of average intelligence creates emotional, social and economic problems. Then follows a section on "People and Sex," with general considerations of basic sexual drives and problems arising from these. Chapter 5 presents the effects of unusual happenings like war, disease, social and economic failure on the equilibrium of people, emphasizing that catastrophe may actually lead to improvement in some and be used as rationalization for illness in others, and that the patient must be considered the product of the effect of environment upon his hereditary tendencies. Depressive reactions are discussed under the heading of "Unhappy People," and here manic-depressive psychosis and neurotic depressions are described. Mental symptoms resulting from organic disease of the brain of patients in whom alteration in brain function can be demonstrated are described in the chapters entitled, "Dementing People," and "Confused People," with case reports of patients suffering from general paresis, encephalitis, carbon monoxide poisoning, brain tumor, epilepsy, Huntington's chorea, delirium, alcohol, etc. Schizophrenic reactions and the paranoid reactions are referred to in sections on "Dreamy People," "Suspicious People," and "Queer and Twisted People," while other sections describe the psychoneuroses as "Anxious People," geriatric problems as "Older People," and pediatric problems as "The Children."

The third section of the book is a formal consideration of the methods of psychiatry, the history and psychiatric examination, the neurological and physical examination, and various laboratory procedures utilized. Simple advice on the psychiatric interview is given, followed by chapters on therapy, considering such varied approaches as chemotherapy, physiotherapy, hydrotherapy, insulin and convulsive therapy, electronarcosis and frontal lobotomy. In the chapter on psychotherapy, emphasis is given to the so-called short forms of psychotherapy applicable to psychiatric problems one meets in general practice. Throughout the whole book, detailed case reports are given, pointing up the personality of the patients treated and the therapeutic approach. An appendix lists the classification of mental disorders adopted from that approved by the Council of the American Psychiatric Association, and also quotes a report on commitment procedures prepared by the Group for the Advancement of Psychiatry.

The author has obviously and studiously avoided as much of the technical jargon of psychiatry as he could, sometimes sacrificing clarity as a result, but on the whole the volume is an honest exposition of the general kind of psychiatric problems that one meets in practice. Because of its simplicity, the physician who has had little psychiatric background and training can read it with profit.

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THE DOCTOR WEARS THREE FACES. By Mary Bard. J. B. Lippincott Co., Philadelphia, April 15, 1949. $3.00.

The sister of the author of "The Egg and I" reveals a style suggesting that heredity may have some place in wit and humor. She is the wife of a physician practicing apparently in the Pacific Northwest and she writes ably on fourteen points in the thorny path of equanimity. Most physicians' wives will enjoy this book, especially those who attended the quinquennial three-ring circus known as an A.M.A. Convention in San Francisco. The chapter on the author's pursuit and capture of her husband is perhaps the most entertaining in the book. Recommended for light summer fare and not social significance.

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ESSENTIALS OF GYNECOLOGIC ENDOCRINOLOGY. By Gardner M. Riley, Ph.D., Associate Professor of Obstetrics and Gynecology, University of Michigan Medical School. Caduceus Press, Box 17, Ann Arbor, Michigan, 1948. $3.00.

This is an excellent little book which should appeal to students, hospital house officers, and to practitioners who deal with women, because it is quite comprehensive yet is brief, clear and to the point. It is also well documented. The first section, containing 13 chapters on 62 pages, reviews endocrine physiology. This includes discussion of the pituitary hormones, the endocrine function of the ovaries, the effects of the ovarian hormones, the hormonology of menstruation, and the other cyclic changes in the genital tract. Also discussed in this section are the hormone changes associated with pregnancy and with the physiology of the breasts. Short sections take up the hormonal physiology of the adrenal glands, the thyroid and parathyroid glands, the pancreas, the thymus and the pineal body, particularly as their functions are related to genital function.

A second section discusses clinical aspects. This includes consideration of puberty and the menopause, menstrual dysfunctions and the endocrine disorders of pregnancy. Abnormal sexual development such as infantilism and pseudohermaphroditism are discussed. Even the endocrinology of the male is considered. The carcinogenic possibilities of the steroid hormones are discussed.

The third section takes up diagnostic procedures such as the vaginal smear, endometrial biopsy and hormone assays, as well as giving a brief exposition of hormone chemistry, and a tabulation of potent endocrine preparations which are available commercially.

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1948 YEAR BOOK OF GENERAL MEDICINE. Edited by Paul B. Beeson, M.D., J. Burns Amberson, M.D., George R. Minot, M.D., William B. Castle, M.D., Tinsley R. Harrison, M.D., and George B. Eusterman, M.D. The Year Book Publishers Inc., 304 S. Dearborn St., Chicago, 1948. $4.50.

The 1948 Year Book contains abstracts of the pertinent literature in general medicine for the last half of 1947 and the first half of 1948. Paul B. Beeson has replaced George F. Dick as the editor for Infectious Diseases and Tinsley R. Harrison has replaced William D. Stroud as editor for Diseases of the Heart and Blood Vessels. The articles are well abstracted and well arranged. The Year Books are of use essentially to the busy practitioner who can not, or will not keep up with medical literature himself and who prefers his medical information predigested. They are preferable to the summaries of the drug houses which, while often excellent, tend to be biased in favor of their own products.

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An Approach to Some Non-Clinical Responsibilities of Medicine

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> *"Experience teaches us to be most on our guard to protect liberty when the government's purposes are beneficent."*
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> (JUSTICE BRANDEIS, 1928)

FOR the past two decades, especially, the medical profession has been the object of attack by politicians and schemers. Their purposes are camouflaged expertly by artists in deceit. Good will toward all and beneficence for all are promised by the words of these demagogues. Their actual purposes and actual motives, however, are directed toward the ultimate complete socialization of the state and degradation of our present society. Doctors of Medicine long have known the utter falseness of promises made by professional agitators of these schemes. People, however, in great numbers have been unable to realize what is being done under the guise of government benefaction.

Doctors as a group for many generations have been interested only in the scientific advance of medicine and in the clinical application of this knowledge to their patients. Secure in the knowledge of a job well done, charitable toward the shortcomings of people, complacent in the face of unjustified insults, the medical profession has ignored to a great extent its duties in the non-clinical aspects of the practice of medicine.

Hazlitt has said, "The way to procure insults is to submit to them. A man meets with no more respect than he exacts."

Realization of these truths has come finally to our profession. We are resolved to submit to no more insults and to exact the respect that fair dealing with our profession demands. As a group the American medical profession has embarked on an educational campaign to preserve the liberties of American citizens which are now being endangered progressively by apparent government beneficence. The action of our profession has been supported almost unanimously by the individual doctors of America. A pitiful, few, perennial dissenters and their professional liberal friends have opposed our action.

In prosecuting our crusade there are several things that we must realize definitely and then make decision.

We must realize:

1. That there is a definite threat and actual emergent problem before us which must be conquered or submitted to.
2. We must decide whether we intend to conquer or whether we will submit.
3. If we decide we will conquer we must lay out our plan of battle.
4. Given a plan which we accept, we must unite, unswervingly, in following that plan. The Bible says, "He that is not with us is against us."
5. If we be united each must then make the furtherance of our cause his first interest. All else must be secondary even though important.

Practically all thinking people are agreed that there is a problem before us all. Right now, peculiarly, liberty and socialized medicine are rivals for the people's favor. Unfortunately, due to carefully conditioned mental reactions, liberty apparently is dear to most people only up to a certain point—where they desire something more than they do liberty.

Nearly all the medical profession has decided that it will not submit to the socialization of medicine and its sequelae. We are determined that this degradation of medical care shall not be foisted on the people by default. Preliminary plans of battle have

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Address of the President, California Medical Association, at the 78th Annual Session, May 8-11, 1949, Los Angeles.

been drawn and successfully have been carried out, so far, to defeat for the moment, political maneuvers and laws that have been proposed. Our attack thus far has involved, however, mainly a defensive opposition and has been interpreted as a negative attitude by our enemies and by the people who should be our allies. Holding the fort and staving off the emergent attack has been most of our battle so far. True it is, that voluntary prepayment sickness insurance has been elevated as the standard to which we will rally, but the actual coordination and the successful operation of these plans to great enough an extent has not been accomplished as yet. A specific, inclusive, ironclad plan with understandable features must be developed and presented and it must be done soon.

Such a plan must meet the actual needs for medical service; it must be available to all; it must provide adequate remuneration to the physician; it must be offered and available to everyone so that the costs shall be reasonable and the payment cushioned against hardship. Such a plan must have the hearty cooperation of the medical profession. Above all, such a plan must circumvent, once and for all, politicians and schemers who intend to force medical care under domination of government whether there be need or not.

I believe that the acceptance of this non-clinical responsibility in meeting the needs, and settling this problem, is the greatest duty and at the same time the greatest opportunity that we who are now representing the medical profession may ever be privileged to undertake.

It is said that many doctors feel that submission by free people to the dictatorship of socialism is inevitable; that it is predestined or written in the stars for medicine to capitulate to decay. I am reminded of the words of Shakespeare when I see men of medicine degenerating into astrologers:

> *"At some time, men are the masters of their fates.*
> *The fault, dear Brutus, lies not in our stars,*
> *But in ourselves, that, we are underlings."*

With these factors in mind I have sought long to formulate in my own mind an answer that would approach satisfaction. It has been most difficult. However, I have arrived finally at the decision that the following plan, admittedly skeleton in form and subject to perfection, would be efficient and equitable.

As a preamble to my proposal, I would read to you again the official statement of policy of the American Medical Association:

"The American Medical Association reaffirms its belief in the application of the principle of medical care insurance on a voluntary basis. The American Medical Association has encouraged and assisted the development of voluntary prepayment plans. Coverage is now provided throughout the country and protection is being extended rapidly to an ever increasing proportion of our population.

"The American people now enjoy the highest level of health, the finest standards of scientific medical care and the best quality of medical institutions thus far achieved by any major country of the world.

"The great accomplishments of American medicine are the result of development by a free profession working under a free system, unhampered by governmental control.

"The experience of all countries where government has seized control of medical care has been progressive deterioration of the standards of that care to the serious detriment of the sick and needy.

"The American medical profession is unalterably opposed to the institution of any system of medical care which would result in damage to the American public. Our carefully considered opinion is that any scheme of political medicine would be a catastrophe for the American people.

"Compulsory sickness insurance, notwithstanding misleading bureaucratic propaganda, is a variety of socialized medicine or state medicine and possesses the evils inherent in any politically controlled system. It is contrary to American tradition, and is the first and most dangerous step in the direction of complete state socialism. The American Medical Association rejects any such scheme as a method of the distribution of medical care. We are equally certain that when the people understand the facts they also will reject it with the same finality.

"On the basis of experience, we are convinced that voluntary medical care insurance, with the continued support of the American medical profession, can and will solve the economic problem of the distribution of medical care within the existing framework of private enterprise.

"It has been demonstrated that the voluntary method provides a better and less costly service and avoids the imposition of enormous taxation. The continuing purpose and determination of the American Medical Association is to maintain and improve the standards of medical care and to make that care available to all our people."

This should be well publicized and carried as a preamble to all of our endeavors so that there may be no doubt as to the motives or purposes and intentions activating the medical profession in any and all of our activities.

I present, therefore, the following plan:

Each individual Doctor of Medicine shall be asked to pledge allegiance to the following dictum:

I pledge:

A. Objection to government controlled, political or socialized medicine.

1. In discussion of this pledge several things are of utmost importance. First, there must be no misunderstanding as to what the socialists really intend to do. They know that a government plan cannot succeed without the support of the doctors. They intend to force the medical profession to cooperate. This is very evident in the Warren Bill (SB 157) wherein the last paragraph provides that no doctor may accept, receive or obtain any remuneration from most (about 87 per cent) of the population in return for medical services, except that paid by the state. This would make most private practice illegal

under penalty of revocation of license for unprofessional conduct. Practice under these conditions would be slave labor and no less.

2. As long as the people desire my services and make it legal for me to do practice without coercion I will gladly make my services available. I do not intend to practice medicine under slavery conditions.

(This will serve due notice that no one need misinterpret. Having defined what we will not do we must then say as strongly what we will do, in order that the people may know that their doctors will always care for their patients unless the patients themselves, under foolish leadership, make it illegal for the Doctors of Medicine to so do.)

General Washington said, "We must raise a standard to which the wise and honest may repair." Therefore, following the statement of policy of the American Medical Association in its last paragraph, "The continuing purpose and determination of the American Medical Association is to maintain and improve the standards of medical care and to make that care available to all the people," I further pledge:

B. I will confirm and cooperate in all voluntary insurance plans as approved officially by the medical profession as represented by the American Medical Association. Approved plans should embody the following principles in formation:

1. There shall be established standards of benefits to the public which shall meet actual needs for medical care.

2. Determination of fair and adequate remuneration for the furnishing of services, by hospitals and the medical profession in the providing of these medical care needs of the people, shall be made.

3. Thereupon, determination shall be made by competent actuaries as to the cost of premiums to insure the delivery of such services.

4. Insurance companies and all prepaid medical and hospital plans shall be urged to develop and furnish such policies, and cautioned not to fix premiums or charges below sound actuarial minimums. People must not be deluded any more by demagogic promises that lead them to expect good service for nothing. We must give them the best service and show them that it is at a reasonable cost and at a cost that they can afford.

5. Agreement by hospitals and the physicians to accept and abide by these contracts shall be obtained. (The public shall be assured that when the patient abides by his contract and when he accepts only the benefits of the contract and does not in addition pay more to the hospital, for added services, the physician will make no added charge. If the patient desires added services outside his contract with the hospital and pays for obtaining them, then added charges by the physician may be expected as part of the contract. This would leave the decision as to added costs entirely to the will of the patient.)

6. Liaison shall be established between the medical profession, the public, insurance carriers, labor organizations, and employers, with the purpose of enlisting support for all honest and bona fide voluntary plans.

Employers shall be urged to adopt plans whereby they shall pay one-half the premium and the employee one-half. This would be a fixed factor, subject to a constant estimate, and deductible under income tax laws, and therefore the actual cost to the employer would be less than the apparent cost. It should be pointed out that this would be much less cost than under the proposed socialized medicine plans where fixed percentage deductions and many hidden taxes would be obligated on the employer for all of his employees.

Individuals, either employed or unemployed, would have the same benefits available to themselves by paying the total premium if they desired.

If government wishes to enter the picture, it may, as has already been suggested, pay the premiums of indigents or temporarily incapacitated people who are sick. For this principle of subsidization has been established already in other endeavors.

But the true function of government should be to educate the public in regard to: (1) The facilities for care, the type of voluntary plans, the actual benefits that are available to all. (2) People must be shown how to subscribe to these plans and taught to seek the benefits when needed. (3) People must be taught how to use these plans when they have them. (4) Children in our schools should be taught the truth, that sickness is not an abnormal expectation during their lifetime and that they should plan to meet these problems as they arise.

If the government would really tell the truth about these things and teach people how to care for themselves, there would be no need for the compulsion of socialism.

7. The American Medical Association shall continue its present organization, and shall continue its advancement of scientific medical care, and the ethical control of the practice of medicine, to which all its members are bound.

I realize that this proposed plan of meeting the problem which is now confronting the people and the medical profession is not all new. It is a summation of absolute needs. It is compelling to me in its logic as a way to solve a problem which must be and will be solved eventually.

Even now our Congress and our State Legislature are struggling. Under the urging of a President and a Governor, they are deciding what may well be the placing of the last straw on the camel's back. A broken back still is a serious matter even with the best medical care. Without medical assistance it most often is fatal.

Shall medicine sit by and see all that we believe in perish? Shall we submit or conquer in this test to which we are put?

The old crusaders had a motto we all know, "In hoc signo vinces." Today we too must raise our standard.

Now, the doctor must come out boldly in his advocacy of what he believes. He must become a crusader and a salesman, if you will, of voluntary sickness insurance. He must guarantee to the patient certain services and he must see to it that his guarantee is fulfilled.

This plan preserves all the cherished liberties and prerogatives of both the public and the medical profession. It provides a voluntary plan that may be used by all, rich or poor. It preserves the patient-to-doctor relationship. It retains the incentive for the doctor to be the best doctor and to build his practice under his own capabilities. It preserves the American way of life and individual enterprise. It slaps in the face those who contend that free people under liberty cannot care for themselves and must become creatures of the state under a socialized dictatorship.

There are those of us who are fearful; they ask, "Can we be *certain* that this is the answer? Can we be *certain* that the government will allow us to do this? Can we be *certain* that it will work? Can we be *certain* that we should not bow our heads and accept now the stroke of the sword of communism?"

I answer in the words of George Eliot . . .

> *"Nay, never falter: no great deed is done*
> *By falterers who ask for certainty.*
> *No good is certain, but the steadfast mind,*
> *The undivided will seek the good:*
> *'Tis that compels the elements, and wrings*
> *A human music from the indifferent air.*
> *The greatest gift the hero leaves his race*
> *Is to have been a hero. Say we fail—*
> *We feed the high tradition of the world,*
> *And leave our spirit in other breasts."*

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Surgical Treatment of Esophageal Hiatus Hernia by Transthoracic Herniotomy

A Preliminary Report

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SUMMARY

In view of the extensive operation required for repair of hiatus hernia by transthoracic or abdominal approach, herniotomy was done in three cases. Objectives were to (a) widen the esophageal hiatus, (b) remove the hernial sac, (c) cut the structures of the omentum and lesser curvature so that the stomach would lie flat in the chest, and (d) fix the stomach at the new level.

After the operation, all three patients were free of the symptoms of indigestion of which they had previously complained.

SMALL esophageal hiatus hernias are a common observation in routine gastro-intestinal series. These are usually asymptomatic. If symptoms are present, they are usually of such an indefinite nature that the clinician is reluctant to ascribe the symptoms to the lesion. Even when the hernia is large, the symptoms are vague. Harrington[3] in a series of 404 cases, 287 of which were esophageal hiatus hernias, found the most common symptoms to be pain, abdominal distress, gaseous eructation, vomiting, dyspnea, hemorrhage, weakness, anemia and palpitations, in that order. He applied the term "masquerader" to this entity.

When the hernia is found by x-ray to be large and the patient has the above symptom complex, most clinicians will agree that the hernia is the responsible lesion. The symptoms are thought to be produced by traction on the peritoneal sac of the hernia and by progressive incarceration and obstruction of the stomach through the small opening in the diaphragm.

Repair of the hernia, either transthoracically or abdominally, is an operation of considerable magnitude. Even in Harrington's large experience, nine out of ten recurrences in his series were in the esophageal hiatus group. It occurred to the authors, after noting at first hand and in many cases reported in the literature how asymptomatic were patients with thoracic stomachs after esophageal resection, that it would be much simpler to treat an esophageal hiatus hernia by means of herniotomy than by various plastic repairs to the diaphragm.

Those who have had the greatest experience with esophageal resection have noted that patients with intrathoracic stomachs following resection of the esophagus have comparatively few complaints referable to the position of the stomach in the chest. Brewer and Dolley[1] state: "Actually, unless the patient has been informed as to the operative procedure used, in practically every instance he will not suspect that his stomach rests high in the thoracic cavity. For the presence of this organ in the posterior mediastinum and vertebral gutter produces no symptoms, formidable as it appears in the postoperative x-ray films." Sweet[4] stated that these patients almost never experience any sensations which might make them aware of the presence of the stomach within the thorax. Occasionally gastric peristaltic sounds are heard. Such functional disturbances as have been noted, he believes, may be due to the delayed emptying time secondary to the vagotomy which must be done in resection for carcinoma. DeBakey and Ochsner[2] mentioned one patient who noted a "splash" when he swallowed.

When the stomach is brought through the diaphragm, it is anchored securely to the diaphragm and mediastinum. Furthermore, the opening in the diaphragm is usually of considerably greater width than the esophageal hiatus. In repair of a para-esophageal hiatus hernia, as with an inguinal hernia, an opening of just the proper size must be left so that the esophagus will not be constricted. Bringing the stomach into the chest avoids this difficulty.

It has been suggested that in some instances the hernia through the hiatus is secondary to the shortening of the esophagus which in itself is either congenital or secondary to esophagitis. The general experience with repairing hernias of this type by replacement into the abdomen has been quite unsatisfactory.

With these considerations in mind, (a) widening of the esophageal hiatus, (b) removal of the hernial sac, (c) cutting the structures of the omentum and lesser curvature until the stomach lies freely in the chest, and (d) fixation of the stomach at its new level, three patients have been so treated.

CASE REPORTS

CASE 1: A 42-year-old white male entered the hospital with complaint of "indigestion" of about one year's duration. He stated that the stomach filled with gas and seemed to go up in the chest. This occurred in attacks and was followed by a dull gnawing pain over the anterior chest wall on the left. The pain came on when the patient lay on his back and was

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From the surgical services of the Stanford University School of Medicine and the Letterman General Hospital, San Francisco.

relieved by vomiting. It was also occasionally relieved by taking baking soda or by changing position. On several occasions, the patient had vomited "black material." He had not lost weight, had not lost appetite, and gave no history of vomiting blood or passing blood by rectum.

The patient also had a history of low back pain and pain down the right thigh beginning some four years previously. Physiotherapy was given at that time, with improvement after one month. There had been several recurrences of this type of pain.

The past history and family history were not remarkable. The patient had had typhoid fever 20 years ago and a right inguinal herniorrhaphy nine years ago.

Physical examination: The patient was stocky, 67 inches tall, weighing 175 pounds. The blood pressure was 140 mm. of mercury systolic and 90 mm. diastolic. There was an old right hernia scar. Measurement of the calf showed that the right calf was 0.5 inch less in circumference than the left.

Laboratory: Erythrocytes numbered 3,850,000, with hemoglobin 10.3 gm. per 100 cc., while leukocytes numbered 6,500. The urine was clear with no albumin, sugar or cells. Results of Wassermann and Kahn tests were negative. Plasma proteins totaled 6.8 gm. per 100 cc., with albumin 4.6 gm. and globulin 2.2 gm. per 100 cc.

X-ray examination of the lumbar spine was reported as follows: There was some scoliosis of the lumbar spine, convexity to the right, and the upper lumbar spine was normal. There was marked forward displacement of the fifth lumbar vertebra and the entire lumbar segment on the sacrum with roughening and sclerosis of the bony margins of the adjacent surfaces. There was also a break of the continuity of the posterior margin of the upper end of the sacrum which probably represented a fracture line permitting the forward displacement (spondylolisthesis).

A gastro-intestinal series (Figure 1) showed that there was an esophageal hiatus hernia with a narrow diaphragmatic opening, about one-third of the stomach being above the diaphragm.

An electrocardiogram was normal.

With the patient under intratracheal anesthesia, the left chest was opened through the bed of the seventh rib. The lung was retracted and the hernial sac with its contents easily identified in the posterior mediastinum. The sac was opened and the stomach freed. The lesser curvature vessels were freed for the distance which the stomach lay above the diaphragm. The omentum was next cut off a corresponding distance on the greater curvature. The diaphragm was then opened so that the opening equalled the width of the stomach at this level. The excess peritoneum of the sac was then excised. Next the stomach was tacked to the diaphragm at this same level with interrupted silk sutures around its entire circumference. It was noted that the esophagus had shortened so that it still appeared normal in contour at this higher level.

The mediastinum was then closed, the lung re-expanded and the chest wall closed without drainage.

Postoperatively, the patient had considerable pain in the back ascribable to the spondylolisthesis. This pain subsided as soon as the patient felt well enough to walk on the fourth postoperative day. Three weeks later the erythrocyte count had increased to 4,550,000, with hemoglobin 14.4 gm. per 100 cc. The patient noted complete disappearance of all abdominal symptoms immediately postoperatively. When last observed two and a half months after the operation the patient was symptom free.

Figure 2 shows the position of the stomach postoperatively with the patient standing, and in the Trendelenburg position. The stomach was fixed to the diaphragm in the thorax with a wide opening through the diaphragm.

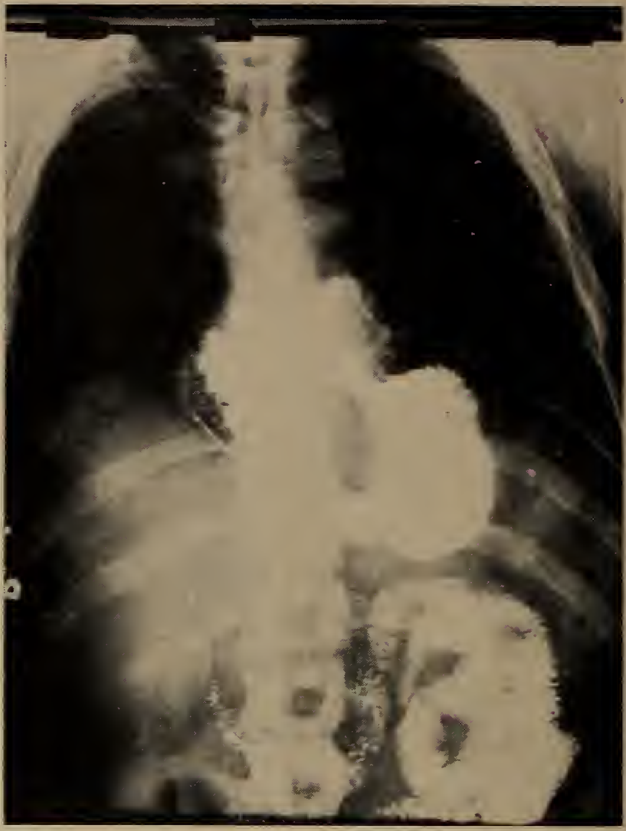

Figure 1.—Case 1 preoperatively showing narrow neck of hernia with about one-third of stomach in chest.

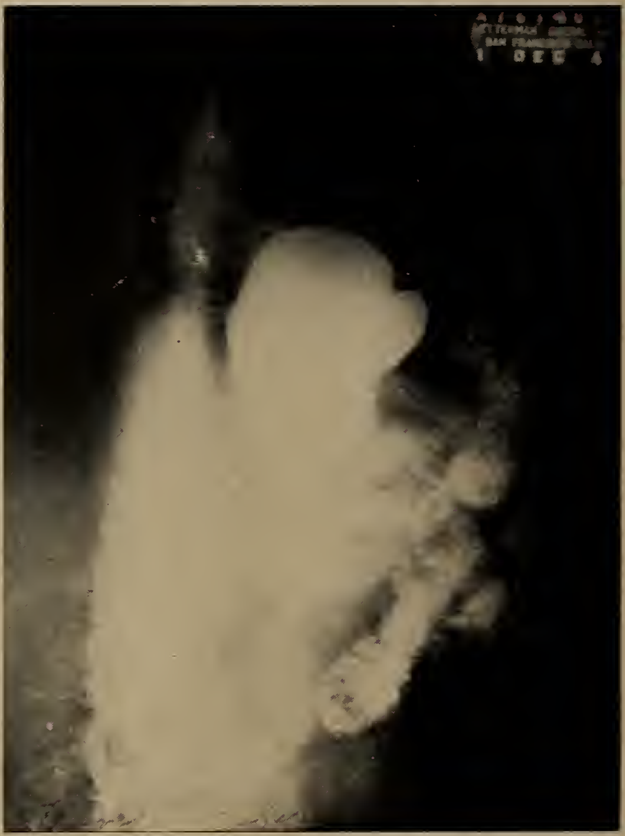

Figure 2.—Case 1 postoperative film in Trendelenburg position showing wide opening through the diaphragm.

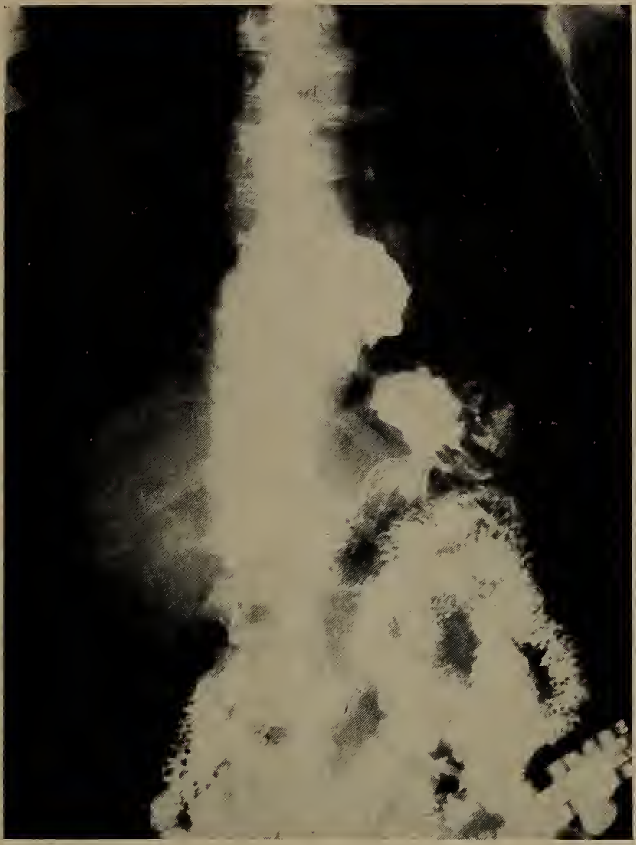

Figure 3.—Case 2 preoperative film.

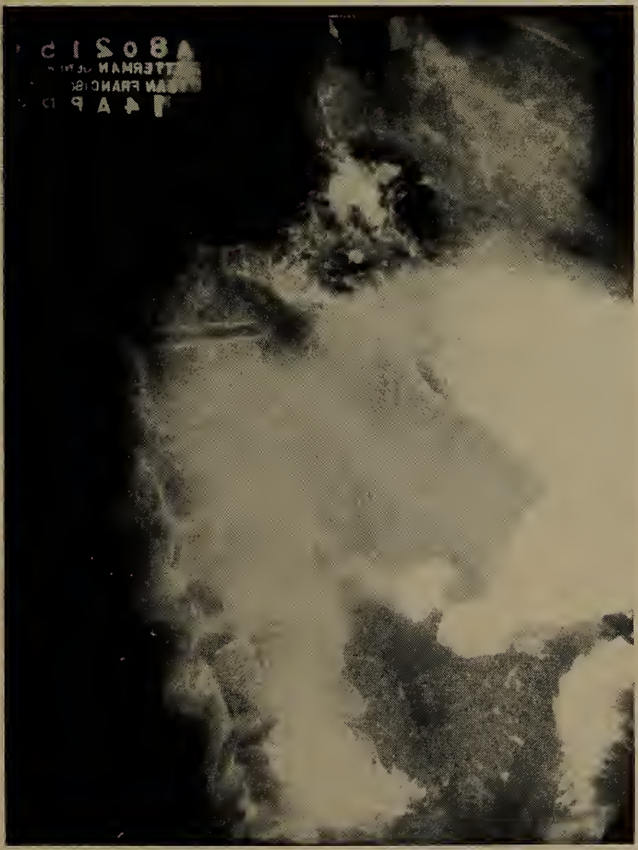

Figure 4.—Case 2 postoperative film.

Case 2: A woman 48 years of age complained of "indigestion" of many years' duration. Innumerable forms of medical therapy including diets had been tried without any dramatic relief. Relapses followed brief periods of improvement. There had never been any episodes of severe pain, and only occasional vomiting. The patient's weight had remained approximately stationary and there had been no episodes of hematemesis or melena.

General physical examination was not remarkable. Blood pressure was 160 mm. of mercury systolic and 95 mm. diastolic. Examination of the blood showed no evidence of anemia. A gastro-intestinal series (Figure 3) showed a para-esophageal hiatus hernia with a narrow ring and varying amounts of stomach, up to one-half, above the diaphragm.

An operation was performed in the manner described in the report of Case 1 with complete relief of symptoms. Figure 4 shows the gastro-intestinal series postoperatively.

Case 3: A man 64 years of age who had been in vigorous health except for vague indigestion for many years, noted that about one year before entry the indigestion became worse and was more regularly associated with ingestion of food; occasionally, especially at night, he became nauseated and vomited. Vomiting brought immediate relief.

Physical examination revealed that the trachea was displaced to the right but nothing else of note. A roentgenogram of the chest showed that the mediastinum was retracted to the right. A gastro-intestinal series showed a diaphragmatic hernia with a constant mass of barium in a crater in the herniated portion of the stomach. The roentgenologist interpreted this (Figure 5) as a gastric ulcer.

An operation was performed in the manner previously described. A follow-up gastro-intestinal series (Figure 6) showed that the constant filling defect had disappeared. The chest plate (Figure 7) showed the diaphragm elevated on the left. This patient had a moderate amount of pain in the chest wall postoperatively but was completely relieved of the digestive symptoms. Follow-up six months later showed that

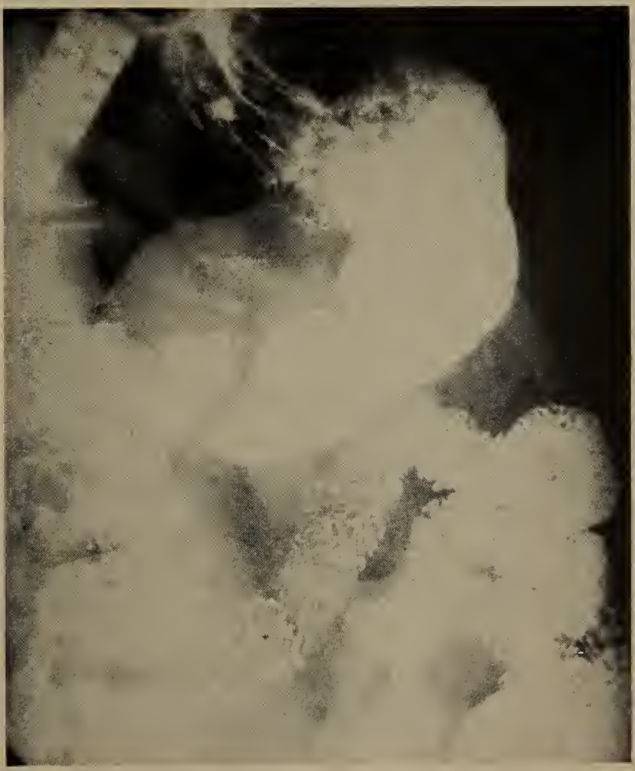

Figure 5.—Case 3 preoperative film showing fleck of barium constant on repeated examination. The hiatus in this instance is not narrow.

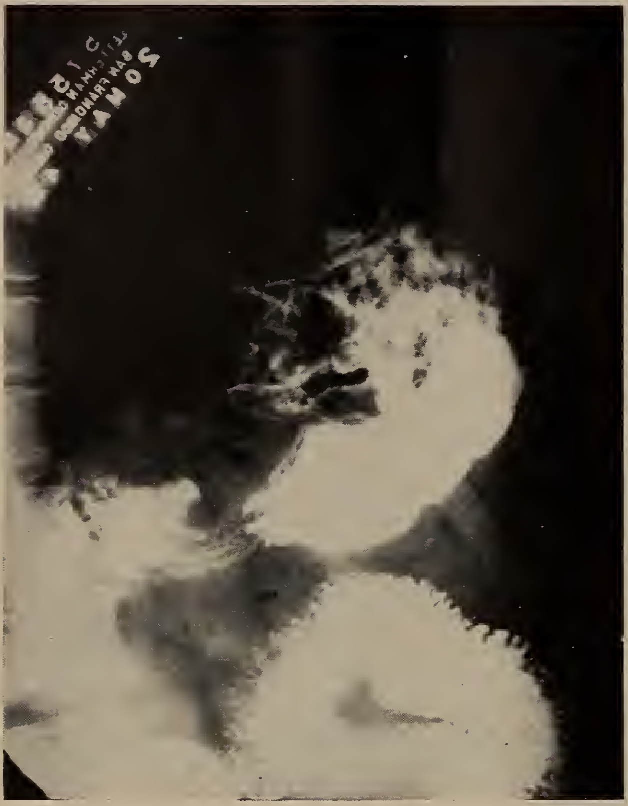

Figure 6.—Case 3, postoperative film showing that constant fleck has disappeared (this was coincident with the abatement of symptoms).

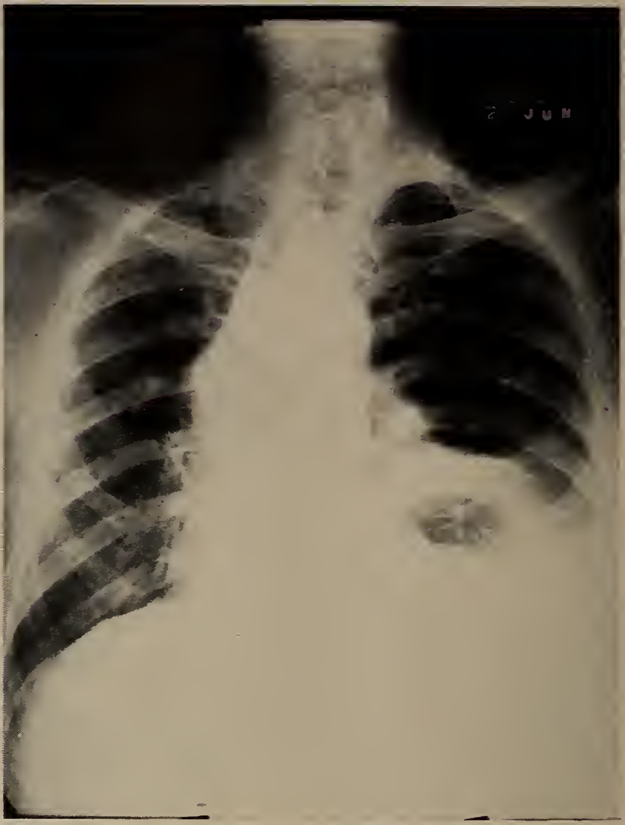

Figure 7.—Case 3 postoperative chest film. Distortion of the mediastinum has not changed.

the patient was symptom-free, and at that time he stated that he never really realized how much indigestion he had had until he had been relieved of the symptoms.

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The Diagnosis and Surgical Treatment of Tetralogies

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SUMMARY

Patients with congenital heart disease of the cyanotic type may be presumed to be candidates for surgical treatment if the examination of the heart reveals compatible findings, particularly murmurs characteristic of an interventricular septal defect, overriding aorta, and pulmonary stenosis; if the electrocardiogram shows right axis deviation; if the x-ray or fluoroscopic study demonstrates decreased pulmonary markings; if Diodrast injection shows right ventricular enlargement, a septal defect, overriding of the aorta, and small pulmonary arteries.

In some cases some of these criteria may be missing. If there are not definite contraindications, exploratory thoracotomy is indicated for patients with congenital heart disease causing cyanosis.

THE development of a technique for by-passing a stenotic pulmonary valve or a hypoplastic pulmonary artery and improving oxygenation of the blood[2,3] has brought to the clinician the responsibility for identifying cases in which the technique can be applied. The occurrence of pulmonary stenosis alone as a cardiac lesion is rare. Its occurrence in combination with other lesions is common, most particularly in the tetralogy of Fallot with an interventricular septal defect, dextroposition of the aorta, and hypertrophy of the right ventricle (sometimes also an interauricular septal defect).

The study of autopsy material gave the first impetus to progress in the diagnosis of congenital heart lesions. The usual short life span of patients with cyanotic cardiac disease made material available in the study period of the observer and reliable criteria were established for common lesions. Extensive correlations between clinical and autopsy findings were made in 1,000 cases analyzed by Abbott.[1]

Diagnosis was furthered by the determination of circulation times which contributed information on intracardiac shunts. The subjective end points are very difficult to elicit in small children and the methods therefore are not widely applicable.

Diagnosis has been advanced remarkably by the use of intravenous cardiography for identification of cardiac lesions. By serial x-ray studies at short intervals, Diodrast injected into the left antecubital vein is followed through the heart.[5,6,7] The Diodrast may outline venous anomalies en route to the heart. The Diodrast is under pressure and will pass from the right to the left auricle through an interauricular septal defect. If the Diodrast passes from the right auricle to the right ventricle, then simultaneously to the pulmonary artery and aorta, an overriding or transposition of the aorta is demonstrated. Diodrast outlining the pulmonary vessels may show them to be oversized as in the Eisenmenger complex or undersized as in the tetralogy of Fallot. The pressure of injection diminishes with time and dilution and Diodrast does not pass from the right to the left ventricle to demonstrate a septal defect. The Diodrast may return to the left heart from the lungs and pass from the left to the right side of the heart through the defect. This passage of Diodrast is referred to as refilling of the right heart. Diodrast in the aorta may demonstrate hypoplasia or coarctation of the vessel. Diodrast which passes from the aorta into the pulmonary artery through a patent ductus causes refilling of the left side of the heart. Dilution of the medium is so great at this stage that judging densities in films is difficult and the evidence for a patent ductus becomes largely presumptive. If a ductus is a possible compensatory lesion for a pulmonary atresia the lesions should be diagnosed by venous catheterization[4] or by retrograde aortography.

Following is a review of 20 cases of congenital heart disease of cyanotic type. In 15 of the cases the clinical diagnosis of tetralogy of Fallot was proven surgically (Group I). In five cases in which clinical diagnosis was questionable, operation disclosed that tetralogy was not present (Group II).

REVIEW OF CASES

In only two cases of the series was there a family history of congenital heart disease. In one of the cases a macerated twin was delivered with the baby. In one case there was maternal bleeding for the first three months of pregnancy.

The time of appearance of cyanosis varied from birth to 3½ years. There was the same wide variation in the time of observation of the murmur. The delay in appearance of cyanosis or in the development of a murmur may be the result of inexpert observation or an increase in venous arterial shunt with increase in peripheral load because of body growth, or it may be the result of closure of a ductus.

Difficulty in feeding, which was noted in five cases, seemed to be partly from dyspnea which interfered with the effort of taking food and partly from passive congestion which interfered with digestion. Constipation seemed to be correlated with the

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feeding difficulty. In view of parents' amazement at postoperative appetite in all surviving patients, it is noteworthy that difficulty in feeding was a preoperative complaint in only five cases. The postoperative increase in activity contributed to the increase in appetite.

Syncopal attacks occurred in one child in warm weather, in one child without any expenditure of effort and in eight others when their activity exceeded the limits of their oxygenation. In two cases the syncopal attacks were associated with convulsions. In neither of these cases has there been syncope or convulsions postoperatively. In four cases there was complaint of great distress in warm weather, possibly because of increased peripheral load with vasodilatation.

The deciduous dentition (Table 2) was noted in these cases because of interest in the marked contrast between poor deciduous dentition and good permanent dentition.

A precordial bulge was present in nine cases. In all except one case it was associated with cardiac enlargement. There was no cardiac enlargement in six of the patients with tetralogy. The enlargement was to the left in six cases, to the left and right in two cases, and to the right in one case. A basal thrill was present in six cases.

The murmurs were interpreted as follows: The systolic murmur in the left fourth interspace with or without a thrill was called the murmur of an interventricular septal defect. From the experience with Diodrast study on a patient with a systolic murmur in the left third interspace in which overriding of the aorta was the only lesion,[5] the systolic murmur in the left third interspace was called the murmur of an overriding aorta. There were no cases in which there was absence of femoral pulsations to introduce the possibility of coarctation. The systolic murmur in the left second interspace with or without a second sound was called the murmur of pulmonary stenosis. The pulmonary second sound was present in 12 of 15 patients with tetralogy and was greater than the aortic second sound in three cases. This finding is contrary to general understanding. In the two seven-year-old patients, in one eight years old and in one 11 years old, all three murmurs could be distinguished. In smaller patients, so small that the stethoscope covered a large proportion of the cardiac area, only two murmurs could be distinguished, and in one child only one murmur could be distinguished.

TABLE 1.—*Salient Points in History of Cyanotic Heart Patients*

Case No.	Age	Family History	Maternal Illness, First Trimester	Appearance Cyanosis	Appearance Murmur	Feeding Difficulty	Constipation	Retardation of Development	Recurrent Respiratory Infections	Limitation of Activity	Syncopal Attacks	Convulsions	Distress with Extremes of Temperature	X-ray Trt. for Thymus
1.	16 mo.	......	......	3 days	5 days	++	+	+	......	++	++	......	......	......
2.	17 mo.	+	......	8 mo.	Birth	......	......	......	......	++	++	......	+	+
3.	19 mo.	+	......	8 mo.	9 mo.	+	+	+	......	+	......	......	......	......
4.	18 mo.	......	......	6 wk.	5 mo.	......	......	......	+	++	++	+	+	+
5.	22 mo.	......	......	6 wk.	5 mo.	+	+	+	......	+	+	+	......	......
6.	3 7/12 yrs.	......	......	Birth	Birth	......	......	+	......	+	......	......	+	......
7.	3 8/12 yrs.	......	......	8 mo.	9 mo.	......	......	......	......	+	......	......	......	......
8.	2 9/12 yrs.	......	......	2 mo.	2 mo.	+	......	+	......	++	+	......	......	......
9.	2 11/12 yrs.	......	......	4 mo.	4 mo.	......	......	......	......	++	+	......	......	......
10.	4 3/12 yrs.	......	......	6 mo.	2 yr.	......	+	......	......	+	±	......	......	......
11.	4 8/12 yrs.	......	......	3½ yr.	3½ yr.	......	+	+	+	++	......	......	......	......
12.	7 10/12 yrs.	......	......	Birth	Birth	......	......	+	......	++	+	......	......	......
13.	8 yrs.	......	+	Birth	Birth	......	......	......	+	+	......	......	......	......
14.	7 9/12 yrs.	......	......	Birth	Birth	++	......	+	......	++	......	......	......	......
15.	11 yrs.	......	......	Birth	?	?	......	+	......	++	......	......	......	......
16.	9 mos.	......	......	6 wks.	6 wks.	......	......	+	......	+	+	......	......	......
17.	2 4/12 yrs.	......	......	Birth	Birth	......	......	+	......	++	......	......	......	......
18.	2 2/12 yrs.	......	......	Birth	Birth	......	......	+	......	++	......	......	......	......
19.	4 7/12 yrs.	......	......	Birth	Birth	......	......	+	......	++	......	......	......	......
20.	12 4/12 yrs.	......	......	7 days	7 days	......	......	......	......	++	+	......	+	......

In small patients accurate blood pressure determinations are difficult to obtain. The range of pulse pressures was from 22 to 45 mm. of mercury.

In only one case was there a manifest associated congenital anomaly, a hypospadius. No associated anomaly was discovered at autopsy of the patient with tetralogy or at autopsy in the three cases in which tetralogy was not present.

There was no correlation demonstrated between the higher hemoglobin, red blood cell, and packed cell volume determinations and the syncopal attacks.

The electrocardiogram showed right axis deviation in all the patients with tetralogy. The one death in the 15 cases reported was that of a patient with a right bundle branch block. Of six patients who died in the course of investigation of cyanotic heart disease, four had right bundle branch block. One patient died with induction of anesthesia for Diodrast study, one died with injection of Diodrast, one during transplantation operation (Case 18 in Table 4) and one shortly after operation (Case 11 in Table 4).

The x-ray and fluoroscopic examinations revealed no characteristic configuration for a tetralogy. In five cases the heart appeared normal. The examinations were useful, however, in denoting the position of the aorta. The clinical and x-ray determination of enlargement coincided with moderate accuracy.

The Diodrast examination demonstrated an overriding aorta in 12 of 15 cases of tetralogy and in the two cases of Eisenmenger complex. The pulmonary arteries were judged as being small in five patients with tetralogies by x-ray examination and in seven by Diodrast examination. In two cases in which the Diodrast study indicated the pulmonary arteries were large, they proved small (Cases 12 and 14). In neither of the two cases of Eisenmenger complex was the Diodrast study diagnostic for en-

TABLE 2.—*Salient Physical Findings in Cyanotic Heart Patients.*

	Degree Cyanosis	Deciduous Teeth	Development	Precordial Bulge	Clubbing	Area Cardiac Dullness	Murmur	P_2	BP	Associated Anomalies
1.	++	....	Poor	......	+	Thrill at base. Not enlarged.	M_S L. iv, i.s. M_S L. ii, i.s.	....	....	....
2.	+	....	Fair	+	+	No thrill. Enl. l. & r.	M_S L. ii, i.s.	±	arm 100/70 leg 140/100	....
3.	++	Poor	Good	......	+	Enl. l. & r.	M_S L. ii, iii, i.s.	+	....	....
4.	+	....	Fair	......	+	No enl. Fine S. thrill at base	M_S L. ii, iv, i.s.	A_2	98/70	....
5.	++	....	Good	......	+	Enl. to left. Basal thrill.	M_S L. ii, iii	A_2	....	....
6.	++	....	Poor	......	++	Enl. to left.	M_S L. iii, iv, i.s.	+	100/80	....
7.	+	....	Good	......	+	Thrill L. iii. No enl.	M_S L. ii, iv	+	120/80	....
8.	++	Fair	Fair	++	++	Enl. to left.	M_S L. iii, i.s.	+	115/?	+
9.	+	....	Good	......	++	Enl. left. Thrill at base.	M_S L. ii, iii, i.s.	+	100/68	....
10.	++	....	Fair	+	++	Normal. Short thrill, L. ii, i.s.	M_S L. ii, iv, i.s.	+	105/60	....
11.	++	Poor	Fair	+	++	Enl. to left.	M_S L. ii, iii, i.s.	+	110/80	....
12.	++	Poor	Fair	......	++	Enl. to rt.	M_S L. ii, iii, iv, i.s.	A_2	110/70	....
13.	+++	Poor	Fair	+	++	To A.A.L. left.	M_S L. ii, iv, v	$=A_2$	108/86	....
14.	++	Poor	Poor	......	++	Not enl.	M_S R. i, ii, iii	....	110/78	....
15.	++	Poor	Poor	+	++	Normal.	M_S L. ii, iii, iv	+	110/80	....
16.	+++	None	Poor	......	++	Not enl.	None	absent	....	....
17.	++	Fair	Poor	Sternal ++	......	A.A.L. left.	M_S L. iv	absent	....	....
18.	++	Poor	Poor	Rt. +	++	Enl. l. & r. Thrill L. iii.	....	....	70/50	....
19.	++	Poor	Fair	+	++	Sl. enl.	M_S L. ii	A_2	....	....
20.	+	Poor	Good	......	+	Not enl.	M_S L. iii, ii	A_2	110/80	....

Abbreviations: P_2 refers to second pulmonary sound. BP refers to blood pressure. RBC refers to erythrocytes of the blood. PCV refers to packed cell volume (erythrocytes of blood).

TABLE 3.—*Salient Laboratory Findings in Cyanotic Heart Patients.*

	Hgb. %*		RCB		PCV				
	Preop.	Postop.	Preop.	Postop.	Preop.	Postop.	Ecg.	X-ray and Fluoroscopy	Diodrast
1.	85	80	5.50	6.90	....	48	PR 0.11, Depr. ST1, 2. Rt. axis dev.	Globular ht., marked enl. in l. vent. segment.	Overriding aorta. I-V septal defect, small P.A.
2.	118	103	4.20	5.16	51	48	PR 0.12. QRS 0.06. Rt. ax. dev.	Enl. to left and rt. Feeble pulse left PA.	Overriding aorta. Rt. heart > left.
3.	178	104	8.12	5.89	71	62	PR 0.12. QRS 0.07. Rt. ax. dev.	No pulm. puls. Rt. sided aorta. Contour normal.	Overriding aorta, rt. sided arch, no cross chamber filling.
4.	106	......	5.30	......	48	....	PR 0.16, QRS 0.05, Mod. rt. axis dev.	Rt. sided aorta. Hrt. not enlarged.	Overriding aorta. Pulm. stenosis.
5.	118	116	5.96	6.25	49	45	PR 0.15. QRS 0.08. Rt. axis dev.	Vascular markings reduced. Rt. sided aorta.	Left PA < rt. Overriding?
6.	170	124	7.45	5.81	....	52	PR 0.14. QRS 0.07. P_2 tall. Rt. ax. dev.	Left cardiac bulge. No hilar pulsations.	Rt. side large. No cross chamber mixing.
7.	121	88	6.27	4.25	50	38	PR 0.15. QRS 0.07. Rt. ax. dev.	Size upper limit of normal.	Overriding aorta. pulm. stenosis. No intracardiac shunt. PDA?
8.	158	100	7.43	5.09	66	53	PR 0.15. QRS 0.07. Marked rt. ax. dev.	Rt. vent. mod. prominent.	Rt. Ventricular enl. Overriding aorta. Small P.V.
9.	154	90	7.40	5.82	57	50	PR 0.14. QRS 0.08. Rt. ax. dev.	Sl. enl. aortic arch on left.	Overriding aorta. no intracardiac shunt.
10.	160	110	6.0	5.57	76	53	PR 0.12, QRS 0.08, Marked rt. ax. dev.	Minimal enlargement. Left sided aorta.	Overriding aorta. Pulm. vessels light.
11.	142	......	11.0	......	82	....	Rt. bundle branch block, PRO 12. QRS 0.08.	Normal.	....
12.	128	108	7.10	......	55	49	PR 0.12. QRS 0.07. Rt. axis dev.	Pulm. markings decreased on left. Rt. sided aorta.	Overriding aorta. Well filled PA.
13.	176	122	10.0	6.60	....	52	PR 0.15, QRS 0.12, Tall P_2, Notched P_3.	Congenital hrt. Rt. sided aorta?	Lrg. intracardiac shunt. Prob. I-A. ? I-V defect.
14.	131	104	7.98	6.16	61	48	....	Rt. side enlarged.	No shunt. PA appear large.
15.	126	99	8.90	4.67	56	39	PR 0.16. QRS 0.09. Depressed ST2, 3. Rt. ax. dev.	Normal.	Lrg. rt. hrt., overriding aorta. PA small.
16.	140	......	7.12	......	62	....	PR 0.12. QRS 0.07. Rt. ax. dev.	Prominent left border and pulm. conus. Sl. enlarged.	Rt. & L. sup. vena cava; L. into rt. auricle & aorta. Lt. ht. not outlined.
17.	174	144	9.10	9.08	69	....	PR 0.12, QRS 0.08, Deep S1. 2. 3. Rt. ax. dev.	Prom. rounded left lower border; rt. pulm. vessel enlarged.	Overriding aorta; no cross chamber mixing.
18.	110	......	7.26	......	68	....	PR 0.12. QRS 0.12. Depressed ST1. Elev. ST2, 3. Rt. BBB.	Situs inversus of abd. viscera; aortic arch on left.	....
19.	148	......	7.40	......	72	....	PR 0.13, QRS 0.08. Broad $P_{2,3}$. P waves, marked rt. ax. dev.	Stomach on left; hrt. Abnorm. on rt. Small pulm. vessels.	Systemic blood into left hrt., floods both ventricles.
20.	138	140	5.70	6.57	64	60	....	Normal.	Overriding aorta. I-A septal defect.

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*14.5 gm. equals 100 per cent.

largement of the pulmonary arteries. An intracardiac shunt was demonstrated in two cases of tetralogy and in one of Eisenmenger complex. Diodrast demonstrated successfully the right auricle and aorta in the complete transposition and the interchamber mixing in the bilocular heart.

The results of anastomosis were most gratifying. The function was excellent in nine of fifteen cases. In the four cases in which the result was rated as good, the estimate was difficult to make because the remaining cardiac lesions produced cyanosis. In the case in which the result was rated as fair, the mental retardation of the patient possibly limits activity. The child's parents, however, feel that he has made definite improvement.

The youngest child to have anastomosis was 16 months. It is not generally accepted that a child under that age would have structures of sufficient size to make the anastomosis technically feasible. It will be necessary to extend the technique to a younger group to save patients who die from closure of the ductus. The advisability of operation in the early age groups is emphasized by the invalidism of the oldest patient in the group and by the freedom from symptoms and rapid development of the younger patients who were operated upon.

The cases in Group II merit some analysis. The infant (Case 16) was thought, clinically, to have a complete transposition of the great vessels, a condition in which the life expectancy is about five

TABLE 4.—*Type of Anastomosis and Results.*

Operation	Clinical	Physical	Result
1. Left subclavian to left pulmonary.	Eating well. Walking.	Blowing M_S over base.	Excellent.
2. Left subclavian to left pulmonary.	Gaining well. Active.	M_S + D BP 80/60.	Excellent.
3. Left subclavian to left pulmonary.	Eating well. Walking.	Blowing M_S over base.	Excellent.
4. Left subclavian to left pulmonary.	No syncope. Walking.	M_S + D.	Excellent.
5. Left common carotid to left ramus PA.	Eating well.	M_S + D.	Excellent.
6. Left subclavian to left PA.	No cyanosis.	M_S + D.	Good.
7. Rt. subclavian to rt. PA.	Appetite good. Plays hard.	M_S + B BP 80/30.	Excellent.
8. Innominate artery to rt. PA.	Tireless.	Cyanosis + M_S + D.	Good.
9. Rt. subclavian to rt. PA.	Good gain.	Cyanosis + M_S + D.	Good.
10. Rt. subclavian to rt. PA.	No fatigue. Good reserve.	M_S + D.	Excellent.
11. Rt. common carotid to rt. PA.	Died postoperatively.	Pulmonary infundibular stenosis. I.V. septal defect. Rt. ventricular hypertrophy.	Satisfactory surgical anastomosis.
12. Left subclavian to left PA.	Never tires.	Less clubbing. Cyanosis + M_S + D.	Excellent.
13. Rt. subclavian to rt. PA.	More active.	Cyanosis + M_S + D.	Good.
14. Left subclavian to left PA.	More active.	Cyanosis + M_S + D.	Fair.
15. Rt. common carotid to rt. PA.	Active without dyspnea.	M_S + D.	Excellent.
16. Exploratory.	Anastomosis attempted because terminus expected.	Complete transposition. Patent ductus. I.V. septal defect.	No anastomosis. Died postoperatively.
17. Exploratory.	Anastomosis attempted.	Eisenmenger complex.	No anastomosis.
18. None.	Anastomosis not attempted.	Common auricle. Pulmonary stenosis. Aplastic rt. ventricle, hypertrophied. Overriding aorta.	Died after Diodrast.
19. Rt. subclavian to rt. PA.	Anastomosis attempted.	Dextrocardia. Functionally bilocular hrt. Large interauricular septal defect. Aplasia rt. ventricle. Pulmonary atresia. Persistent ductus.	Died on table.
20. Left subclavian to left pulmonary.	Anastomosis done. Some improvement.	No continuous murmur. Eisenmenger complex.	Essentially unchanged.

months. There were no murmurs. The electrocardiogram was not diagnostic. The Diodrast study was confirmatory. Because murmurs are not always present from birth and because of the prognosis, an exploratory operation was performed. Placing a clamp on the pulmonary artery stopped the heartbeat. No surgical procedure was possible. The surgeon felt that it would be possible technically to do an anastomosis at this age should the circumstances warrant.

Case 17 was thought clinically to be one of Eisenmenger complex, and the diagnosis was proven by exploratory operation. The only essential variation between the findings in this case and in the cases of tetralogy was the finding of enlarged right pulmonary vessels by fluoroscopic and x-ray study.

Investigation was considered hazardous in Case 18 because of an incomplete situs inversus and right bundle branch block. The patient had functionally a bilocular heart which was thrown into decompensation by the Diodrast injection.

There was questionable risk for operation in Case 19 because of dextrocardia. The patient, had he lived, would have been helped by the right subclavian anastomosis, because the only blood going into his lungs was going via a ductus arteriosus which was closing by endarteritis. Death was caused by a thrombus which lodged in the narrowed ductus and interrupted circulation.

In Case 20 the patient was considered a doubtful candidate for operation because of failure to demonstrate stenosis of the pulmonary vessels. Inasmuch as dilatation of the vessels could not be demonstrated and the limitation of activity was so great, exploratory operation was decided upon. The clinical improvement has been subjectively fair but objectively unfounded.

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Sickle Cell Disease Simulating Advanced Rheumatoid Arthritis

Report of a Case

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IT has long been recognized that sickle cell disease may present itself in many diverse and variable forms. The case discussed in this paper is unusual because the history, physical findings, and roentgen features closely simulated those of advanced rheumatoid disease.

Sickle cell anemia, first described by Herrick[15] in 1910, is a hereditary and familial form of chronic hemolytic anemia. Although this entity once was thought to be confined to the Negro race, cases have been reported in white families, most of whom were of Mediterranean stock.[6, 7, 11] X-ray findings of the skulls in Mayan Indians were suggestive of sickle cell disease.[20] It has also been described in Mexicans. The sickle cell trait was found in 7.3 per cent of a series of over eight thousand Negroes,[9] with a higher percentage in South African natives.[10]

The trait is transmitted in accord with the Mendelian law of heredity as a dominant characteristic.[16] One out of 40 American Negroes with the sickling trait showed evidence of sickle cell anemia.[9] The disease is frequently found in young people, and cases have been reported in infants as young as five months.

The symptomatology is extremely variable and the symptoms may closely simulate those of many other diseases. Between acute episodes, there may be relatively few symptoms. Then exacerbations with symptoms of sudden anemia, severe abdominal pains, or acute rheumatic fever with migrating polyarthritis have frequently been reported. The heart is often affected;[10] cardiac enlargement was reported in over 80 per cent of a series of 28 cases.[13] Cardiac abnormalities which may occur include arrhythmias, systolic murmur and thrill, prominent pulmonary conus, or even a picture simulating acute coronary occlusion.[30] Occasional cases with renal involvement, manifested by hematuria, have been reported.[1]

The picture of sickle cell disease presenting itself as an acute abdominal crisis is well recognized. However, cases have also been reported in which this process has progressed to shock and subsequently to death.[26] The presence of punched-out ulcers on the anterior aspect of the lower legs in a Negro patient should always arouse suspicion of this disease as an etiologic factor.

Characteristic physical findings in persons with chronic sickle cell anemia are moderate underweight, a short trunk, long extremities, narrow hips, narrow feet, dorsal kyphosis, and atrophic genitalia.[23] Physical findings during acute crises may include fever, splenic friction rub, joint swelling, bone tenderness, jaundice, and, in about 15 per cent of cases, splenomegaly.[25] The presence of gallstones may occasionally be the only findings to suggest blood dyscrasia in a young individual. Neurological signs are frequent;[17] 16 per cent of the patients in one series were mentally deficient.[11]

Roentgenologic abnormalities are frequently found, with the principal changes occurring in the skull, vertebrae, tibiae, and fibulae. In 85 per cent of a series of 48 cases there were abnormalities in the skull, and in 57 per cent there were changes in the long bones.[13] The characteristic findings are: Radial striations in the skull produced by trabecular striations which radiate outward perpendicular to the inner table; osteoporosis of the skull and vertebrae; cortical thickening; new bone formation within the medullary cavity, and patchy irregularities in the density and pattern of the bone structure.[10] Moore[21] noted thickening of the cortex and narrowing of the medullary cavity in adults, while Vogt[27] found thinning of the cortex in infants and children. Brendau[3] found "decreased density and splotching of the medullary portions" in the tibiae and fibulae of a 22-year-old patient. Grinnan[12] described changes in a child confined to the metacarpal bones. The changes were striations. Danford and co-workers[8] described acute changes in a Negro infant consisting of thickening of the periosteum along the shaft, and irregular areas of decreased density at the distal ends of the fourth right metacarpal and second left metacarpal. They also found involvement of the middle and proximal portions of the phalanges of the fourth left and second right fingers with coarse trabeculation at the proximal ends, a band of decreased density at the proximal end involving medullary bone, cortex, and periosteum, and also several punched-out areas within the thickened periosteum, along the shafts. The bony changes appeared and disappeared within one month. Anemia and marked sickling were present during this period of time.

The laboratory findings in sickle cell disease vary somewhat, depending upon the stage of the disease,

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the degree of oxygen saturation, which influences the size of the red cells, the presence of an acute exacerbation, and the presence or absence of anemia together with the sickling trait. Stained smears show most of the cells to be round or oval, with many nucleated erythrocytes, an increased number of reticulocytes, and a few elongated cells. Leukocytosis is usually present. Urinary urobilinogen is increased due to increased hemolysis. The bone marrow frequently shows many nucleated erythrocytes. The sedimentation rate is characteristically slow[5] due to the lack of rouleau formation. Burch[28, 29] has described the method of comparing the rate of sedimentation of blood collected from a vein after stasis to that of the same sample after aeration: a change in the sedimentation rate of at least 20 mm. in 15 to 60 minutes is found. A number of tests have been described to detect the presence of the sickling trait and these have recently been reviewed by Singer and Robin.[24] In addition, they described a new technique involving the incubation of suspected blood with a bacterial culture of an organism utilizing oxygen; a positive reaction for both the sickle cell trait and sickle cell anemia was obtained within 15 minutes by this method.

If sicklemia is present without anemia, a stained smear may be normal, erythrocyte regeneration may not be shown, and in a sealed wet preparation the sickling phenomenon may occur more slowly.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis must include rheumatic fever, other diseases producing skin ulceration, acute abdominal diseases such as mesenteric thrombosis, renal neoplasms causing hematuria, other hemolytic diseases, and rheumatic myocarditis. The differentiation of sickle cell anemia cardiopathy from rheumatic heart disease is based on the following criteria:[14] No response of pain in the joints to salicylates, the presence of jaundice, splenomegaly and/or lymphadenopathy, anemia, reticulocytosis, slow sedimentation rate, presence of sickling, diffuse cardiac enlargement, and characteristic roentgen changes in the bones. The authors have been unable to find in the literature any previous mention of sickle cell disease simulating advanced rheumatoid arthritis.

PROGNOSIS

The prognosis in sickle cell anemia is generally considered to be poor due to the many complications which may arise. The presence of the sicklemia trait was not felt by Diggs and Ahmann[9] to be clinically significant for the following reasons: They felt that it was compatible with long life; they found the incidence in hospital patients to be equal to that in healthy individuals; and they stated that leg ulcers occurred as frequently in normal persons as in those with the sickling trait. However, Bauer[2] felt that there might be the same complications with the sickling trait alone as with sickle cell anemia.

TREATMENT

There is no accepted therapy for this condition at present. Residence in localities at high altitudes is contraindicated because of the increased sickling tendency at low oxygen saturation levels. The administration of oxygen over long periods of time has been attempted in an effort to decrease the sickling tendency of the blood, and while sickling decreased considerably during the period of therapy, it returned to the former rate after cessation of oxygen administration. Murphy and Shapiro[22] postulated that an alteration in the blood coagulability occurs during crises, and they therefore administered anticoagulants in an attempt to prevent thrombus formation. Their efforts were unsuccessful because of the rapid rate at which sickling occurs during a crisis as compared to the relatively slower speed of action of present-day anticoagulants.

CASE REPORT

A 26-year-old Negro male entered the hospital on May 3, 1948, with a history, dating from 1942, of pain and stiffness in the back, left hip, and both knees. He first began having severe back pain associated with low-grade fever in 1942. This was not associated with any other symptoms except moderate weakness, and the symptoms subsided after a few weeks of bed rest. Three months later, swelling and pain in both knees and pain in the left hip developed. The patient had had a low grade fever and marked weakness with this episode, and there was no response to sulfonamide therapy. The painful swelling subsided after four to five weeks of rest. Six months later when the back pain recurred together with fever, a lumbar puncture was performed but no abnormalities were revealed. The patient was relatively asymptomatic between 1943 and 1945, and then began having pain and stiffness in the back and left hip. Extensive studies had been made in private hospitals, but no definite diagnosis had been made. A course of deep x-ray therapy to the back was given with no appreciable improvement. The patient continued to have pain in the hip and back, occasional bouts of low-grade fever, and progressive stiffness with limitation of motion in the left hip. He had lost 20 pounds of weight over a period of three years although there had been no marked anorexia. The past history was entirely negative for any type of arthritis or other rheumatic disease. The patient said that he had not had rheumatic fever, gonorrhea, urethritis, skin ulcers or episodes of acute abdominal pain. The family history was entirely negative for any type of arthritis or blood dyscrasia.

At the time of admittance to hospital, the temperature was 99.8° F., the pulse rate 100, and respirations 18 per minute. There was evidence of moderate loss of weight and malnutrition. Blood pressure was 130 mm. of mercury systolic and 90 diastolic. The heart was not enlarged but there was a soft, Grade I systolic murmur heard best in the second left interspace. The rhythm was regular and there were no other murmurs. The lungs and abdomen were entirely negative. There was some flattening of the normal lumbar curve with limitation of forward or backward bending. There was marked limitation of motion of the left hip, with 30 degrees range of motion in any direction and only minimal motion in external rotation. A moderate degree of atrophy of the entire left leg was present with motor weakness and hypoactive deep reflexes. No other joint abnormalities were noted.

Results of urinalysis and studies of the blood cell content were within normal limits, and a Wassermann test for syphilis was negative. The blood sedimentation rate in repeated tests averaged 2 mm. in one hour. Uric acid levels ranged from 1.7 to 2 mg. per 100 cc., blood calcium was 9.6 mg. per 100 cc., phosphorus was 3.9 mg. per 100 cc., acid phosphatase 1.5 units and alkaline phosphatase 3.1 units. Agglutination studies for undulant fever were negative. Results of liver function studies, including total proteins, prothrombin time, cephalin flocculation, thymol turbidity, and urinary urobilinogen, were normal. Examination of sternal marrow revealed a normoblastic hyperplasia. Repeated tests for blood sickling revealed 20 per cent sickling within 3 to 4 hours and 90 to 95 per cent sickling within 24 hours (Figure 1). Other members of the family were not available for similar blood studies. Erythrocyte counts varied between 5.0 and 5.2 million, hemoglobin values between 92 and 97 per cent of 15.6 gm., and leukocyte counts between 6,000 and 9,500; differential smears were consistently normal. Bleeding and coagulation times were normal.

Radiograms (Figure 2) of both humeri and femori revealed extensive osteoporosis, thickening of the endosteum, narrowing of the medullary canal, flattening with mottled destruction of both femoral heads, to a greater extent on the right side, and narrowing of the hip space with sclerosis and subarticular lytic areas. There were irregular erosion and absorption of a large portion of the articulating surface of the left femoral head together with extensive osteoporosis of the left hip joint. Radiographs of the lumbosacral spine, including the sacro-iliacs, revealed extensive osteoporosis together with fusion of both sacro-iliac joints. The apophyseal joints of the lumbar region showed articular sclerosis. Hypertrophic lipping between L-1 and 2 and minimal lipping of other lumbar vertebrae were present. The spine showed generalized osteoporosis with ballooning of the intervertebral spaces with some irregularity of the superior-inferior borders of the vertebrae. No calcification of the paraspinal ligaments was present. Radiographs of the knees revealed moderate osteoporosis. Radiographs of the skull and other joints were essentially normal except for osteoporosis in all the long bones. X-ray films of the chest were normal.

The patient was treated with physiotherapy and salicylates with slight improvement. During hospitalization, there was an episode, lasting six hours, of severe mid-abdominal pain with vomiting, and a blood smear at this time revealed a moderate degree of sickling.

DISCUSSION

No previous association in the literature has been found between sickle cell disease and chronic destructive arthritis. The authors have cited reported cases in which symptoms simulated those of acute rheumatic fever or acute infectious arthritis, and have also reviewed the changes in the skeleton in this condition, but even standard textbooks on arthritis, such as Comroe's, do not list sickle cell disease as a possible etiological factor in the production of chronic arthritis.

Kraft and Bartel[19] reported a case of sickle cell anemia with recurrent joint swelling and leg ulcers together with extensive roentgenographically demonstrated bone changes. They described rib decalcification, coarse trabeculation of the clavicles, ballooning of the cervical discs with lipping and trabeculation of the thoracic bodies, trabeculation of the sacrum, osteoporosis of the skull with frontal hyperostosis, osteoporosis of the tibiae and fibulae, enlargement of the metatarsal heads and shafts with medullary widening and cortical thickening, and mushroom deformity of the femoral heads. They pointed out that advanced skeletal changes indicate chronicity but not necessarily severity of disease, since normal skeletal findings may be associated with severe anemia.

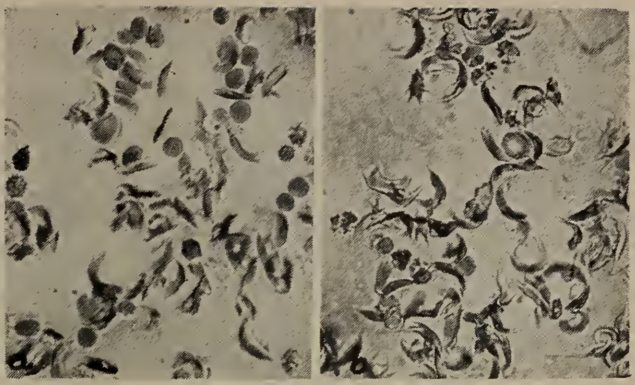
Figure 1.—*Left,* unstained wet preparation after three hours. *Right,* unstained wet preparation after 24 hours.

The case reported is unusual both because of the bone and joint changes, and also because of the degree of bone involvement without an accompanying anemia. There can be little doubt that the patient has sickle cell disease and the bone changes which are found in association with this disease. The pathogenesis of the joint changes is subject to more controversy, however. The findings indicate osteoporosis, irregular bony destruction, narrowing of joint surfaces, and osteosclerosis in the involved joints, principally involving the hip joints. It is felt that this picture is the result of many episodes of hemolysis with subsequent clumping or agglutination of sickle cells resulting in the formation of thrombi in the vascular channels to these joints. The end result is, of course, numerous bone infarcts with ischemia and the well-recognized after-effects of bony destruction in an irregular pattern with repair by fibrosis. The association of fever and marked weakness with these episodes supports this hypothesis. The presence of typical bone changes in the areas surrounding the involved joints also tends to corroborate the diagnosis. The history of episodes of sudden weakness with joint changes in the past, plus the acute abdominal episode associated with sickling observed during hospitalization, indicates that the patient is subject to crises.

The differential diagnosis must include rheumatoid disease of the spine and hips. The sclerosis of the sacro-iliac joints, early changes in the apophyseal joints, presence of irregular low grade fever and some weight loss may all point in this direction. The changes in the hip joints are, however, not typical of rheumatoid disease; the bone changes are those of sickle cell disease; and the lack of response to deep roentgen therapy to the spine all militate against this diagnosis. Another possibility is the association of both diseases simultaneously, and this can hardly be disproven.

The possibility of the hip joint findings being the result of chronic granuloma was tentatively ruled out by the findings of normal chest x-rays, negative skin tests, absence of granulomatous lesions in other bones or parts of the body, absence in the past history of contact with or symptoms of one of the chronic granulomas, and absence of any skin abnormalities.

Osteochondritis of the hip joint was considered, but the onset of the disability within the past five years, absence of history of trauma, bilateral involvement, presence of numerous other abnormalities, and absence of characteristic x-ray findings make this highly unlikely.

Other forms of arthritis such as chronic gouty arthritis were ruled out by history, roentgen findings, normal uric acid levels and absence of tophi, kidney abnormalities, and characteristic arthritic episodes.

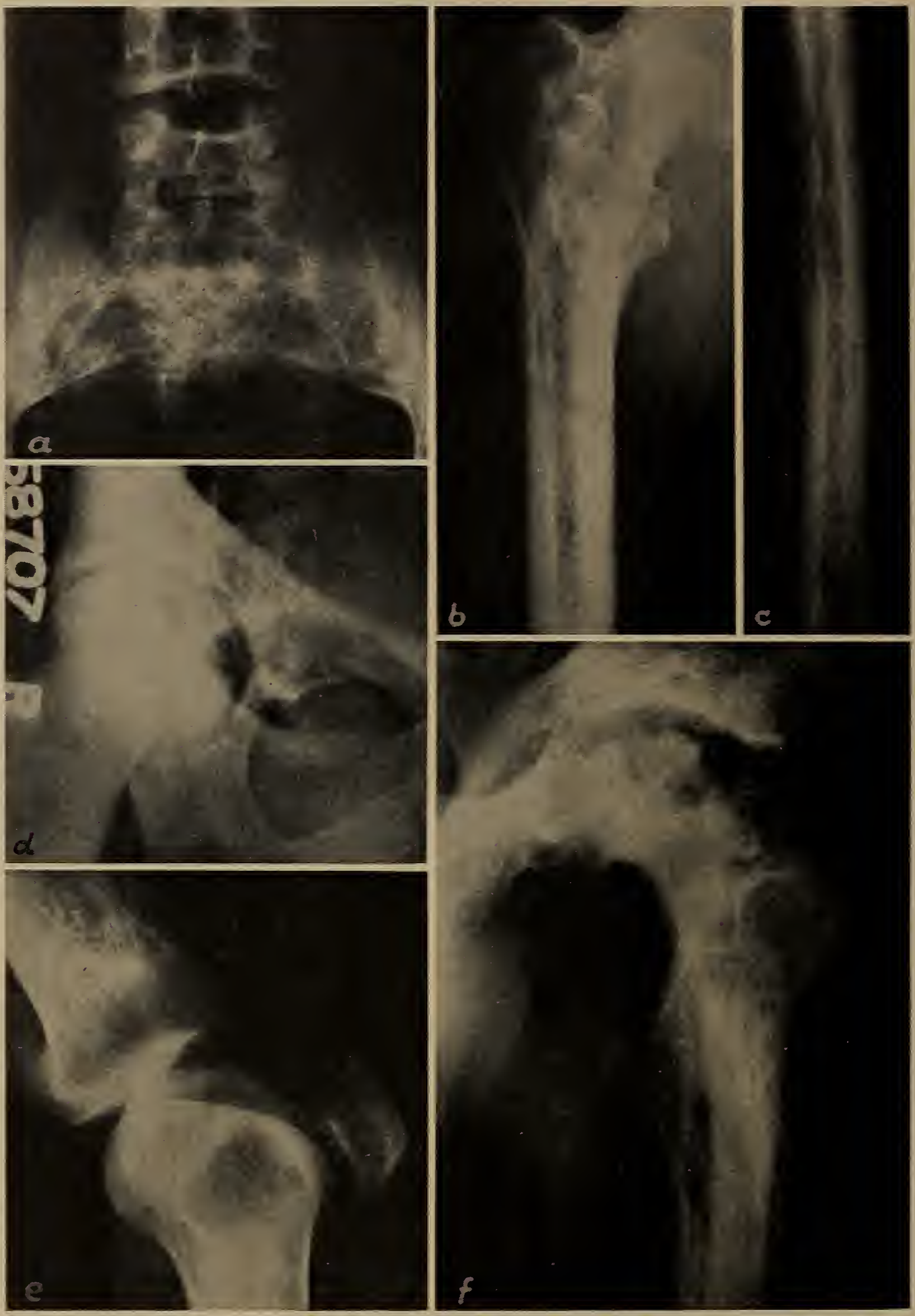

Figure 2.—(a) Spine—extensive osteoporosis, fusion of sacro-iliac joints, articular sclerosis of apophyseal joints, hypertrophic lipping; (b) femur—osteoporosis, thickening of endosteum, narrowing of medullary canal; (c) humerus—osteoporosis, cortical thickening; (d) right hip—mottled destruction of femoral head, narrowing of hip space, subarticular lytic areas; (e) knee—moderate osteoporosis; (f) left hip—irregular erosion and absorption of large portion of articulating surface of left femoral head, osteoporosis, narrowing of hip space with sclerosis.

Gonorrheal arthritis was not considered strongly because of the absence of history of any type of urethritis, the long course, negative complement fixation test, and the spine involvement.

Other hemolytic anemias such as congenital hemolytic jaundice and erythroblastic anemia were ruled out because of their rarity in the Negro race, absence of family history, and absence of characteristic blood findings.

Photographs by William L. M. Mortinsen, F.B.P.A.

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Myelography

Diagnostic Value in Lesions of the Lumbar Intervertebral Discs with a Variation in Technique

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SUMMARY

Myelography using pantopaque in greater than usual amount with a variation in technique, which is described, is believed to provide increased accuracy in differential diagnosis and precise localization of lesions in the lumbar spine. The need for multiple space exploration is eliminated and more detailed information concerning the size and shape of lesions is provided as compared to that secured by the use of 3 or 6 cc. of opaque medium and fluoroscopic examination alone.

In 53 cases in which lumbar myelography was performed and the diagnosis verified or disproved at operation, there was a 5 per cent diagnostic error in 41 instances in which the method outlined was used, as compared with 17 per cent error in 12 cases in which only 3 or 6 cc. of radiopaque material and fluoroscopy alone were used. The accuracy of the procedure would appear to warrant its use in the evaluation of patients suspected of having abnormalities of the lumbar discs associated with nerve root compression.

There still appears to be a sharp difference of opinion concerning the value of myelography, employing the radiopaque medium, as a diagnostic adjunct in the examination of suspected lesions of the lumbar intervertebral discs. In 1941 Dandy[5] strongly urged that the use of contrast media be eliminated. Gillespie[8] expressed the opinion that myelography is unnecessary. A recent article by Arismendi[2] concluded that opaque myelography yields less than a 50 per cent accuracy of diagnosis. Other observers,[1, 7, 9, 12, 13, 14] however, regard the procedure as of considerable value. The authors use pantopaque as a diagnostic agent in all instances in which neural compression from herniation of an intervertebral disc is suspected.

In studies of the lumbar region, previous experience with pantopaque, as well as with lipiodol, led to a feeling of dissatisfaction with the examination as then performed, using 3 or 6 cc.[4, 6, 15] of the medium and fluoroscopic examination with the patient on the tilting table (Figure 1). The oil is confined to the anterior concavity or channel of the dural sac by this technique. Thus, with the patient in the prone position, the material does not extend to the widest part of the intrathecal lumen at all times. The sheaths of the nerve roots usually are not well filled so that lateral herniations of intervertebral discs more readily may escape detection. Since films usually are made with the patient in the prone position only, an inadequate perspective of any demonstrated abnormality is obtained. If the patient is turned from the prone to the oblique position[15] in order to allow the oil to settle in the anterolateral portion of the intrathecal lumen, those

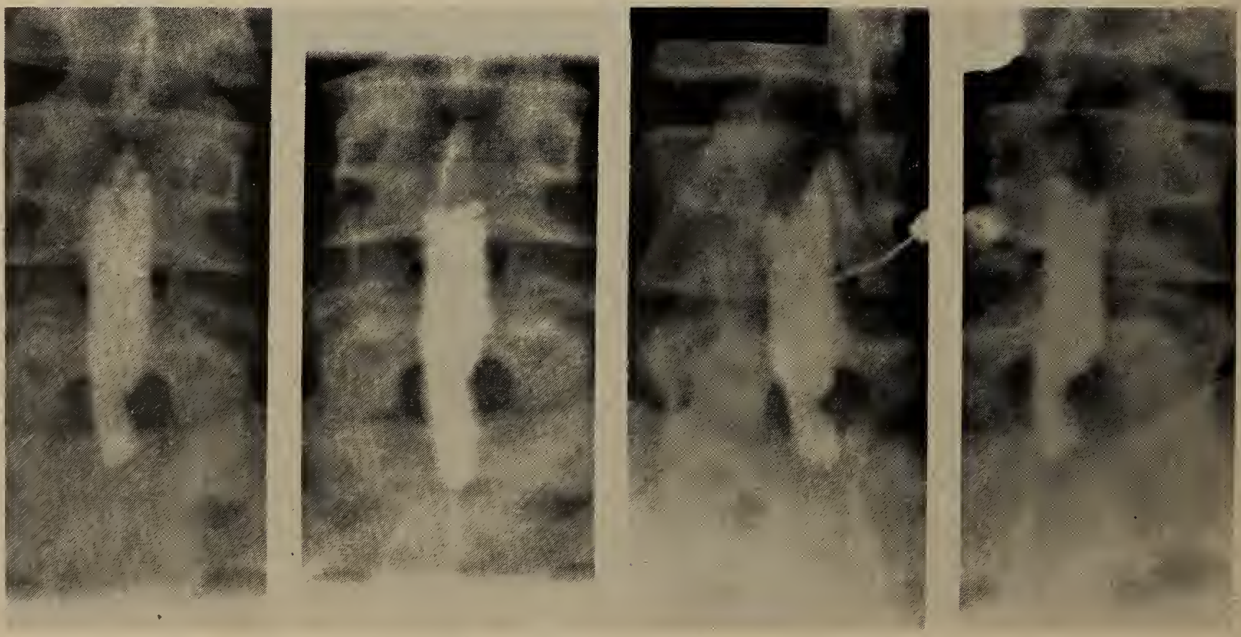

Figure 1.—Fluorographic appearance of a herniated disc at the lumbosacral interspace on the left with 3 cc. of pantopaque.

nerve root sheaths which then are filled are also obscured by the overlying lake of oil, and those which are swung into relief are emptied of oil and therefore not visible. Minor alterations in the contour of the anterior wall of the intraspinal canal may give rise to exaggerated defects (Figures 2 and 3) seen by myelography. The interpretation of these defects is often difficult and occasionally the source of diagnostic error. However, by employing a larger amount of oil for examination of the lumbar region and by using four projections with the patient standing, many of these apparent deficiencies may be overcome. The modification described in the following paragraph has been used by the authors with increasing frequency, and at times the procedure has been used as an instrument of investigation in some patients who complained of persistent pain only in the lower part of the back.

With the patient in a lateral decubitus position, using a 19 gauge needle, a lumbar puncture is performed at the fourth or fifth interspace, selecting the space believed uninvolved. Multiple needle punctures at the time of injection appear to invite extravasation of oil. A quantity of cerebrospinal fluid is removed equal to that of the pantopaque injected. The contents of four ampules of pantopaque[16] (approximately 13 cc.) is injected and four roentgeno-

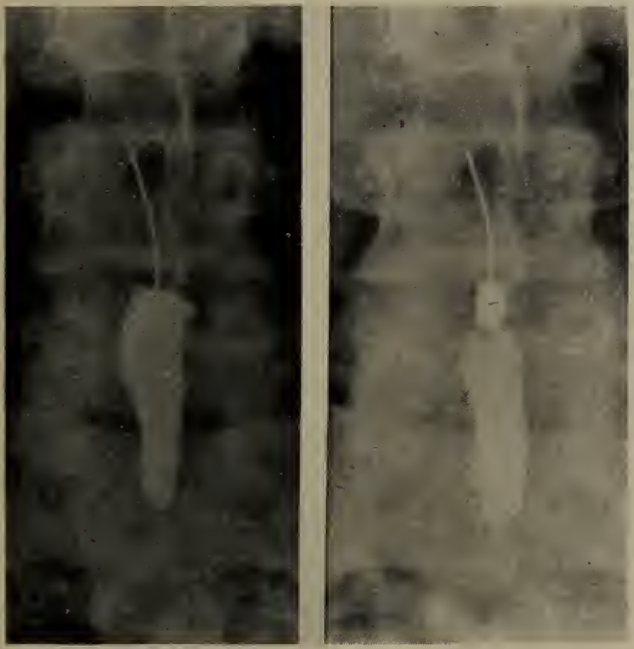

Figure 2.—Persistent defect at lumbosacral interspace misinterpreted as herniated disc (cf. Figure 1).

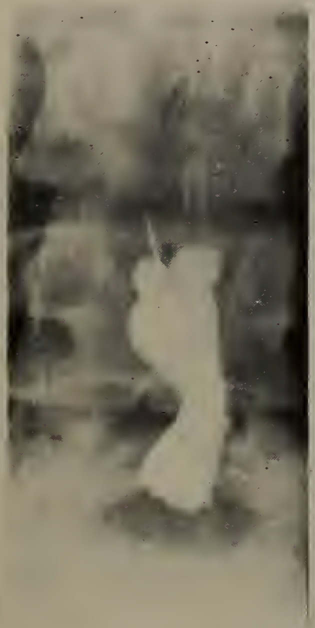

Figure 3.—Unilateral exaggerated defect shown with 3 cc. of pantopaque radiologically misinterpreted.

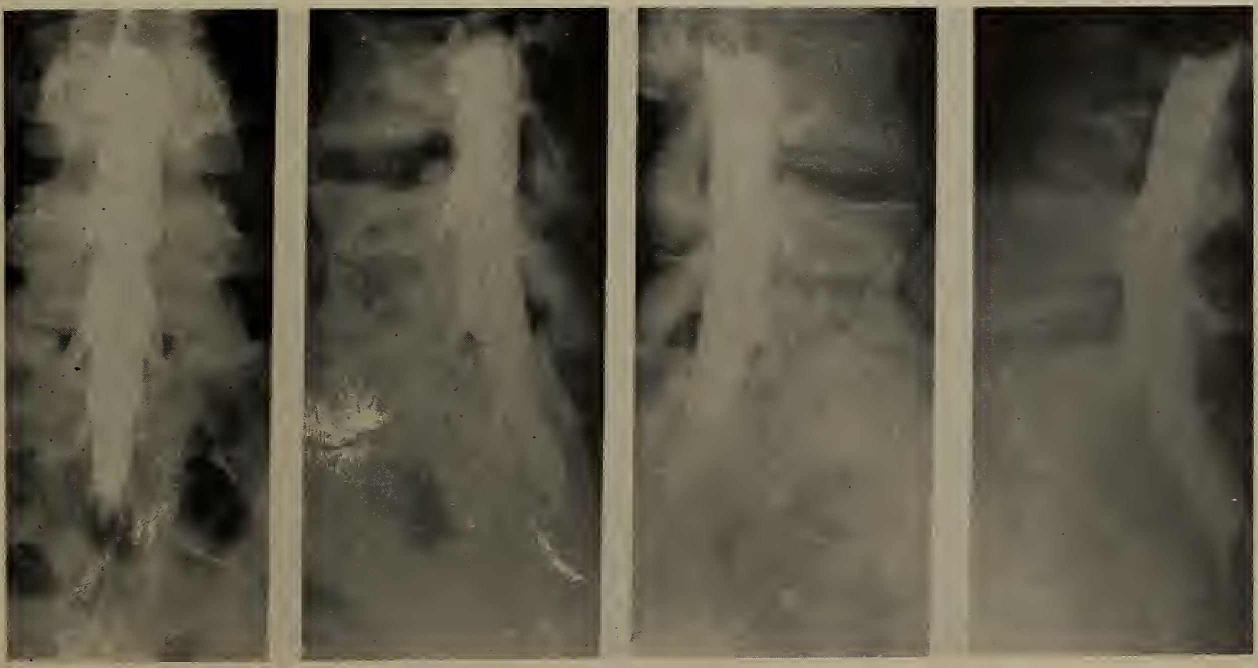

Figure 4.—Average normal sagittal, oblique and lateral projections with 13 cc. of oil.

grams taken using horizontal projections with the patient standing. The four projections (Figure 4) include a postero-anterior, a lateral and two 45-degree obliques. After the roentgenograms have been examined, if no additional views are desired, the procedure customarily has been supplemented by fluoroscopy with the patient on the tilting table. When the examination is completed the oil is withdrawn[11, 14] and the needle removed. The patient is then instructed to remain horizontal for 24 hours. The use of this amount of pantopaque does not appear to be harmful.

This modification of the method of examination appears to overcome the deficiencies[10] previously indicated. Irregularities in the anterior portion of the spinal canal, inconstantly observed and of variable appearance at fluoroscopic examination, present a less confusing picture when outlined (Figure 5) by the greater amount of oil. The full extent of larger defects (Figure 6) is visible by the four projections and a three-dimensional concept of the lesion is gained. Two to five segments of the lumbar area are visualized for comparison (Figures 7, 8, 9, 10) on the same film. The distal thecal sac is fully outlined (Figure 11) in the standing position,[10] as compared to the partial outline of an incompletely filled sac in the prone position. The filling of the lower lumbar and upper sacral nerve root cuffs is greater by this method and the oblique projections bring them into maximum silhouette perpendicular

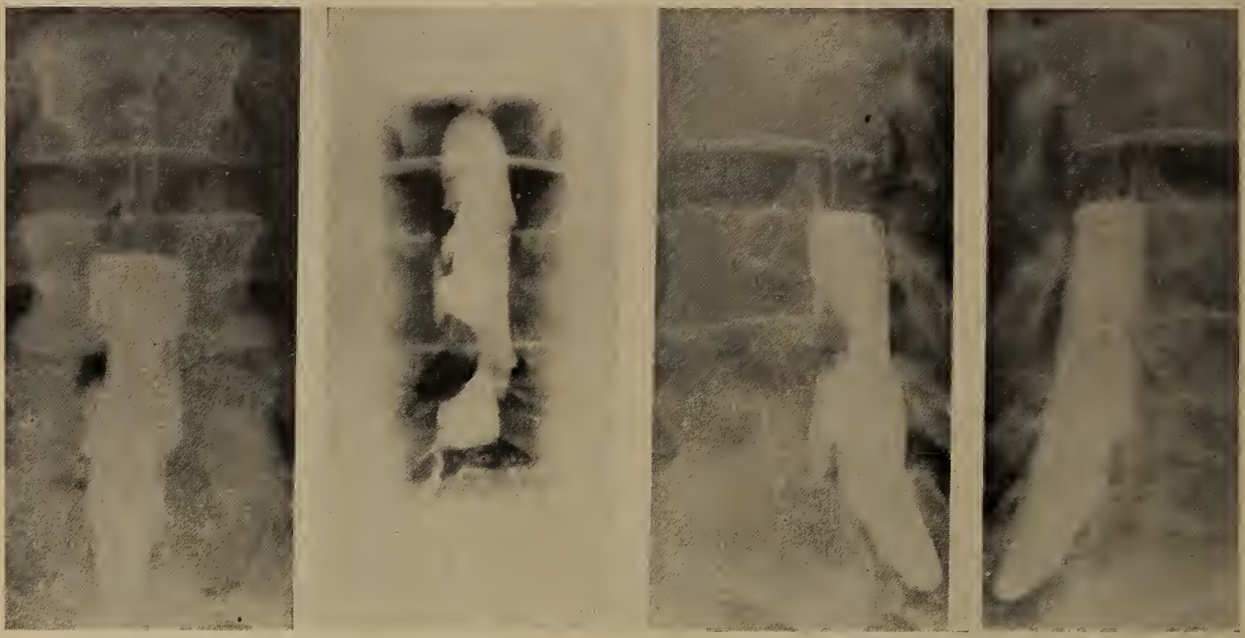

Figure 5.—Disc herniation at the fourth lumbar interspace on the right. Comparison fluorogram with the patient prone and 6 cc. of oil exaggerates the defect and gives incomplete information (cf. Fig. 3).

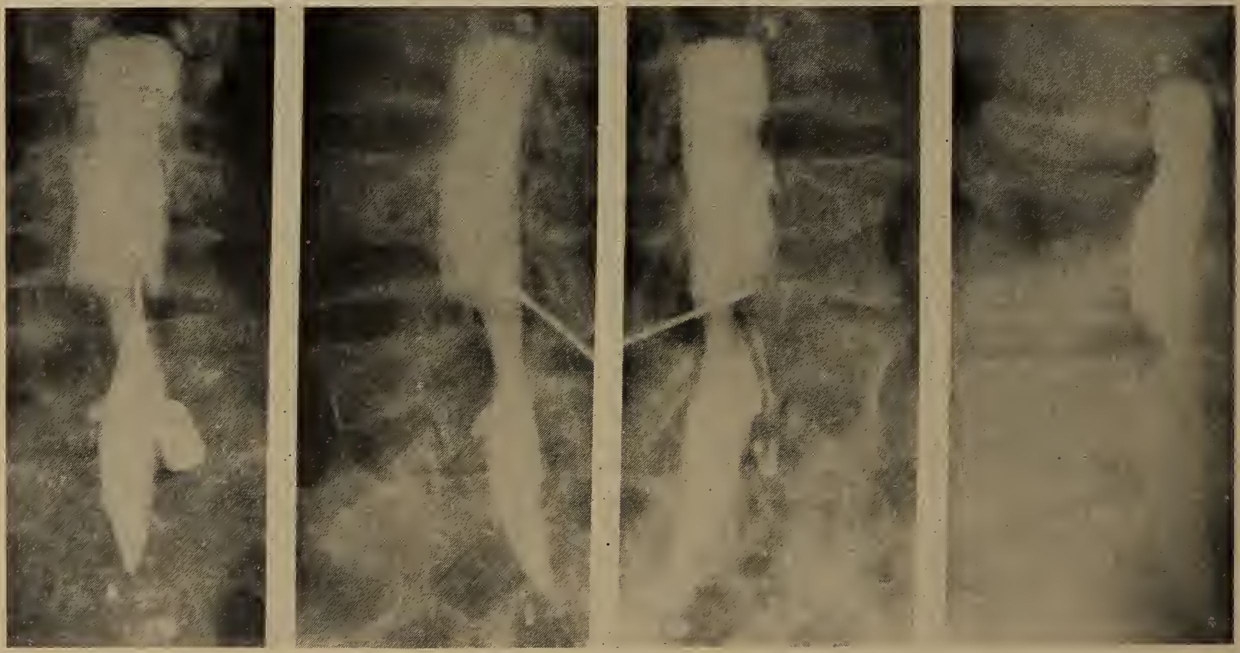

Figure 6.—Complete prolapse of the disc over the fifth lumbar body. Fourth interspace narrowed.

to the direction of the roentgen beam. The overlying column of oil does not obscure the root cuffs in the oblique views. Small lateral herniations may be identified (Figures 12 and 13). Droplet formation is avoided.

In certain instances (Figure 14), herniations of intervertebral discs may be demonstrated to better advantage by utilizing a thin lake[15] of oil than by filling the whole lower subarachnoid space. Hence the need for fluoroscopic examination with the patient on the tilting table after roentgenograms are taken with the patient standing. The two methods are considered supplementary and one is not used to the exclusion of the other.

There are patients who present signs and symptoms implicating one of the lumbosacral nerve roots in whom myelography discloses a defect not characteristic of a herniated disc, but rather a ridge-like deformity of the anterior portion of the radiopaque column. The variable appearance of this defect (Figure 15) can be demonstrated by careful maneuvers[3, 15] with the smaller amounts of oil. The larger amount of oil defines this abnormality more clearly (Figures 16 and 17).

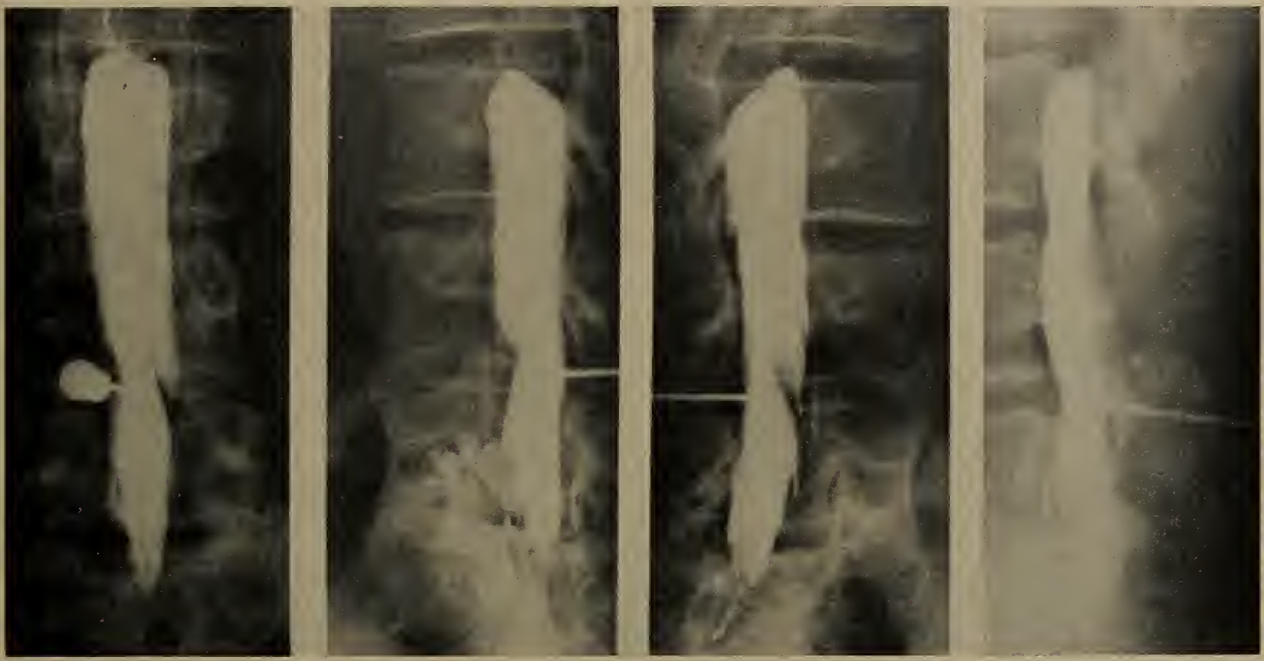

Figure 7.—Disc herniation at the right fourth interspace showing shallow indentation, easily identified by the visualization of a long segment of the canal. Note compression sufficient to reveal adjacent nerves of cauda equina which are rarely visible with smaller amounts of oil.

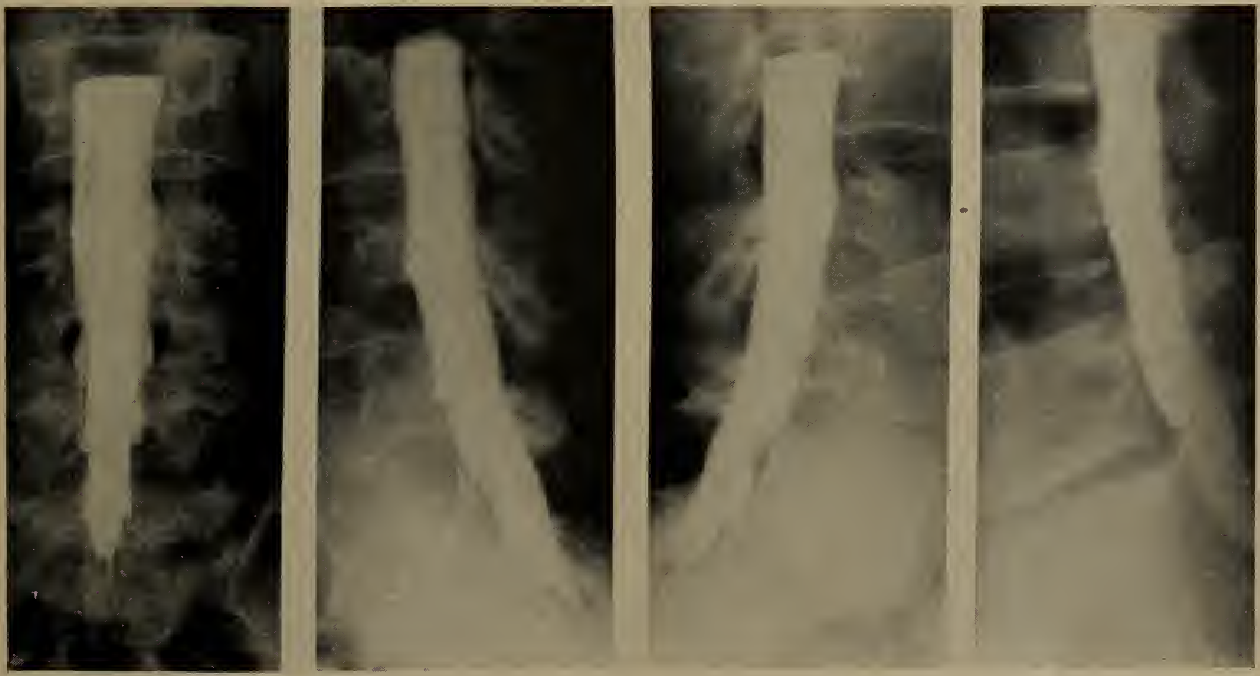

Figure 8.—Small herniation at the lumbosacral interspace on the left suggested by the shortening of the root cuff. Oblique projection diagnostic.

Decompression of the affected nerve root or roots may relieve the symptoms. As it is not the intention to enter into a discussion of the pathologic aspects of the condition, the descriptive term "ridge defect" is used here to designate the radiographic appearance of the abnormality as observed at myelography. The authors are avoiding the use of such controversial terms as "concealed discs," "retropulsions," "protruded discs," and "hypertrophy of the ligamentum flavum." Nevertheless, the defect usually may be distinguished radiologically from the myelographic picture produced by a herniated disc.

One hundred and nineteen consecutive myelograms have been done by one or both of the authors in the past 18 months. Of this number there were 72 in which an abnormality was detected in the lumbar region. The diagnosis was verified or disproved by operation in 53 instances. Considering only this last group of 53 patients the following preoperative diagnoses were made:

Herniated disc	44
Ridge defect	10

There were four error in diagnosis.* Of these, there were two errors (17 per cent) of interpreta-

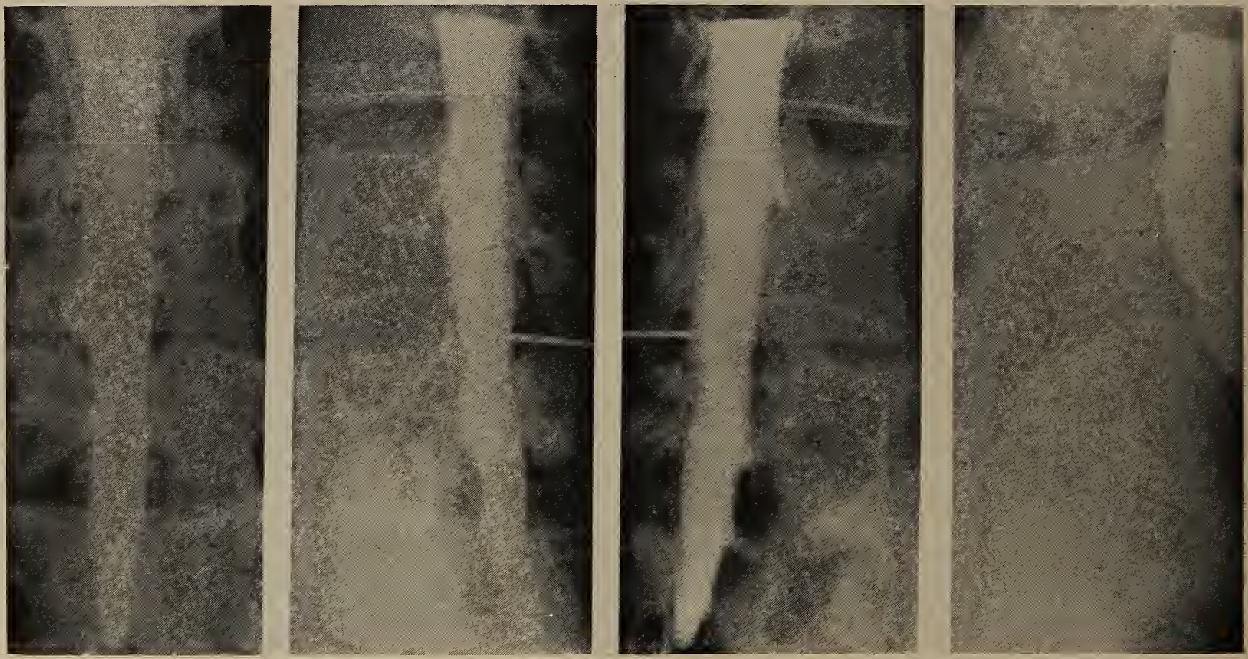

Figure 9.—Disc herniation at the lumbosacral interspace on the right shown only in the oblique projection.

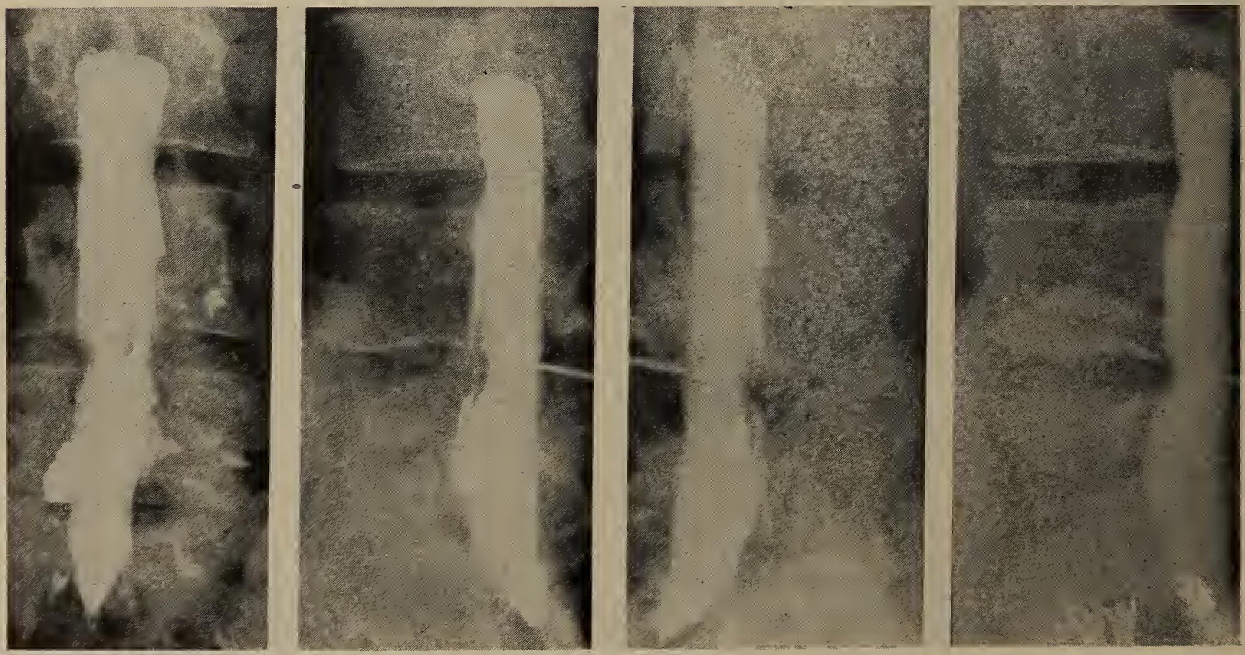

Figure 10.—Disc herniation at the lumbosacral interspace on the left shown only by the gross displacement of the pantopaque column. Note the symmetrical asymptomatic deformity at the fourth interspace.

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*A herniated disc was found in one of the patients operated upon elsewhere. This does not change the authors' statistics, but does indicate the expected probability of diagnostic error in a negative sense, as Arismendi showed in the group of patients operated upon despite negative results of fluoroscopic examination.

tion in 13 myelograms using 3 or 6 cc. of pantopaque. There were two errors (5 per cent) in 41 myelograms, using 12 or more cc. of pantopaque. One error was made the first time the larger quantity of oil was used. In the second error, subsequent events showed that an appearance interpreted as a herniated disc was due to failure of filling of the nerve root cuff caused by edematous swelling of the nerve secondary to pressure of a ridge defect at the interspace above. In both instances there was disagreement between the authors as to the diagnosis.

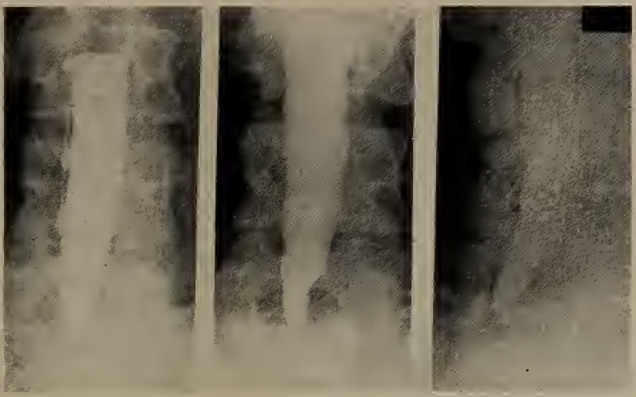

Figure 11.—Disc herniation at the lumbosacral interspace on the left with more rostral termination of the dura. Shown in erect and prone sagittal and oblique projections respectively. Obviously a small amount of oil would have been sufficient in this instance.

ACKNOWLEDGMENT

To Ralph S. Graham, M.D., department of radiology, Sutter General Hospital, Sacramento, California, where the majority of the work was done.

To Orrin S. Cook, Mercy Hospital, Sacramento, California, for making available additional roentgenograms for review.

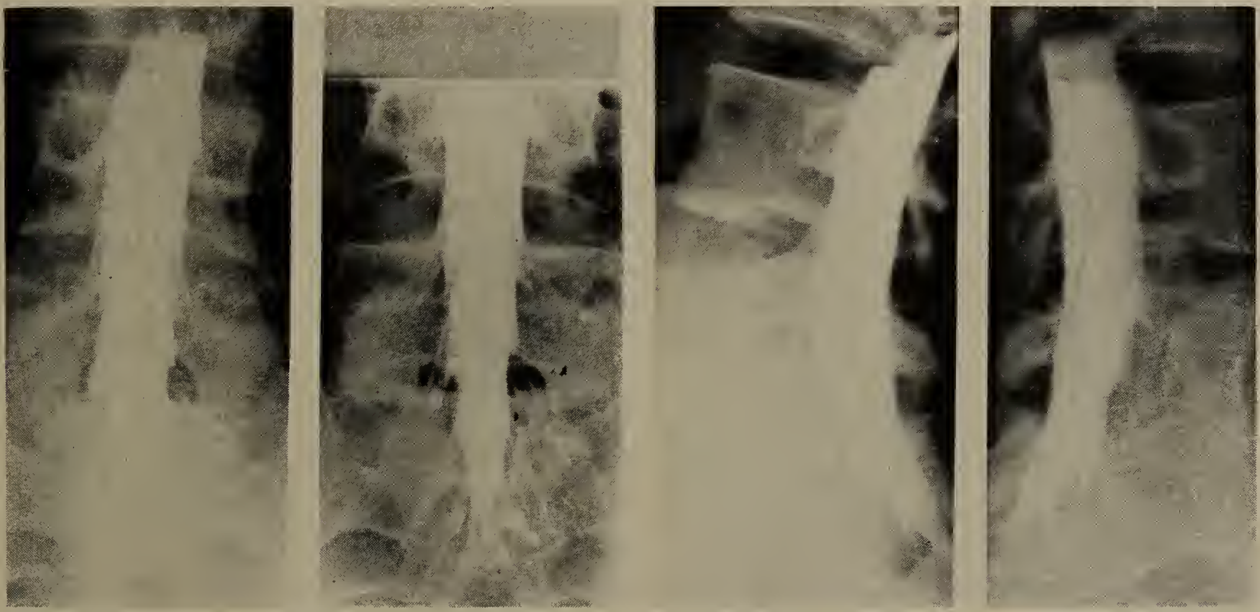

Figure 12.—Small lateral herniation at the lumbosacral interspace on the left clearly outlined by localized root compression. Prone fluorogram shows less complete filling of dural sac but root cuffs have already been filled with the patient erect.

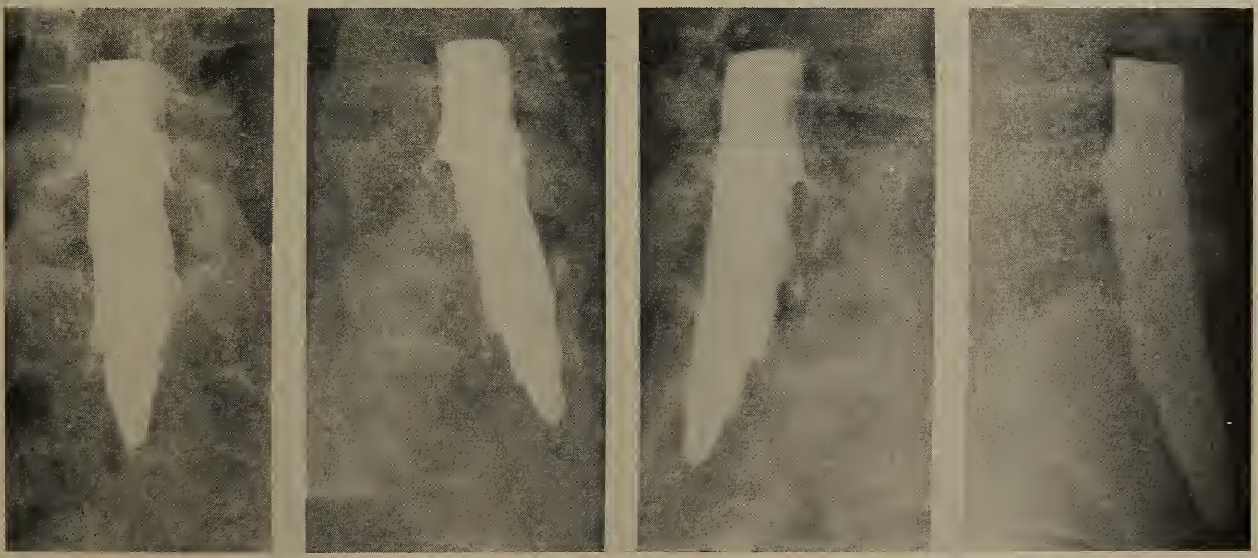

Figure 13.—Lateral herniation at the lumbosacral interspace on the right. Identified only by lack of filling of nerve root cuff and by measurable difference in oblique diameters of pantopaque column.

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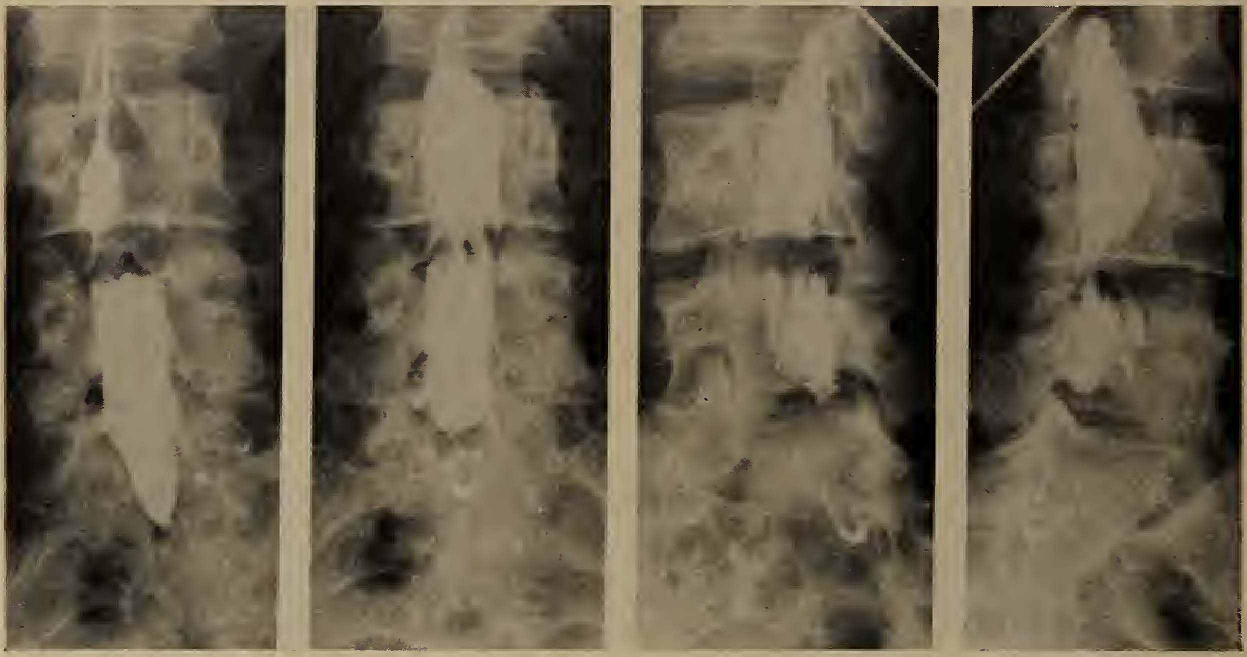

Figure 14.—Centrally placed herniation at the fourth interspace with insufficient pantopaque (6 cc.) to study the area of abnormality with the patient erect. Well shown on fluorogram with patient prone and poorly outlined in oblique projections. This is one of the early cases before using the greatest amounts of pantopaque.

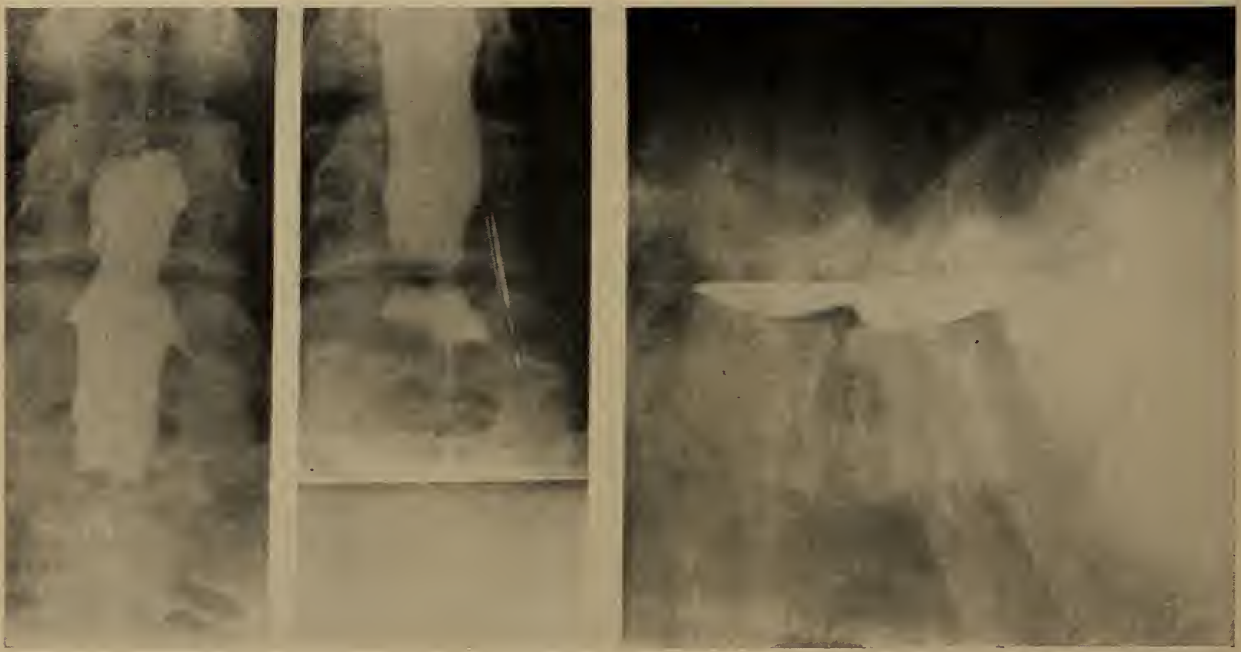

Figure 15.—Variable appearance and incomplete delineation of a narrow "ridge defect" shown on fluorogram and lateral roentgenogram.

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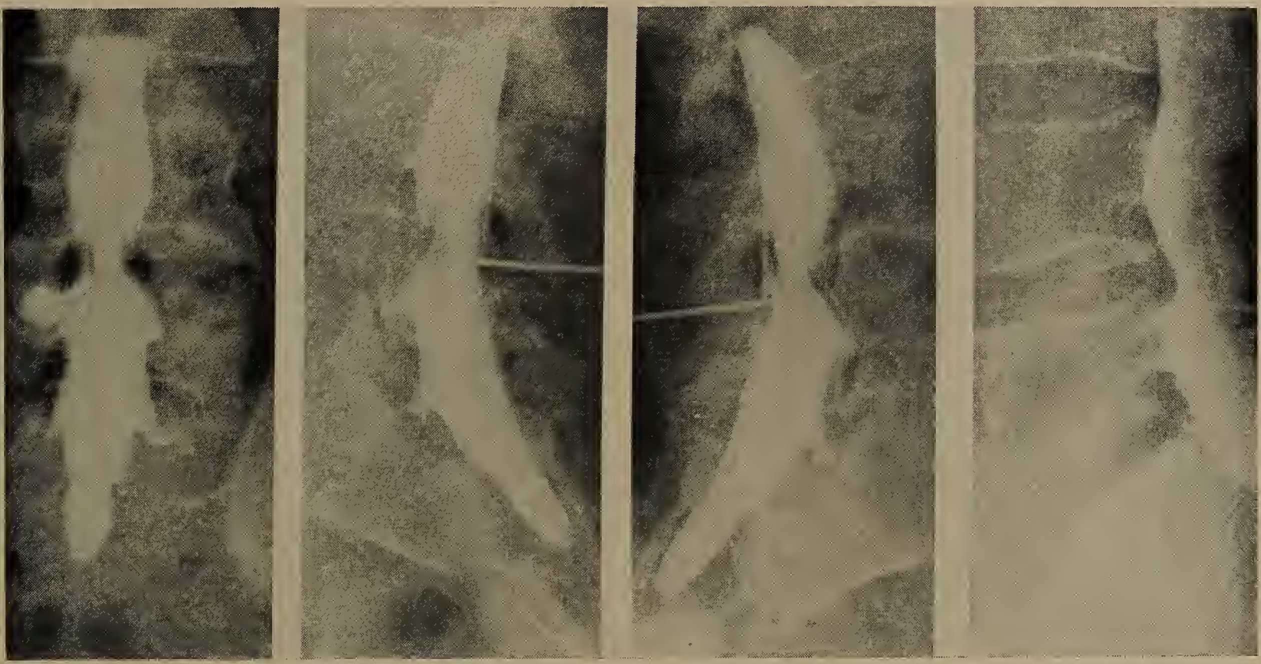

Figure 16.—Large anterior and lateral symmetrical deformity at the fourth interspace, obviously as prominent as many disc herniations.

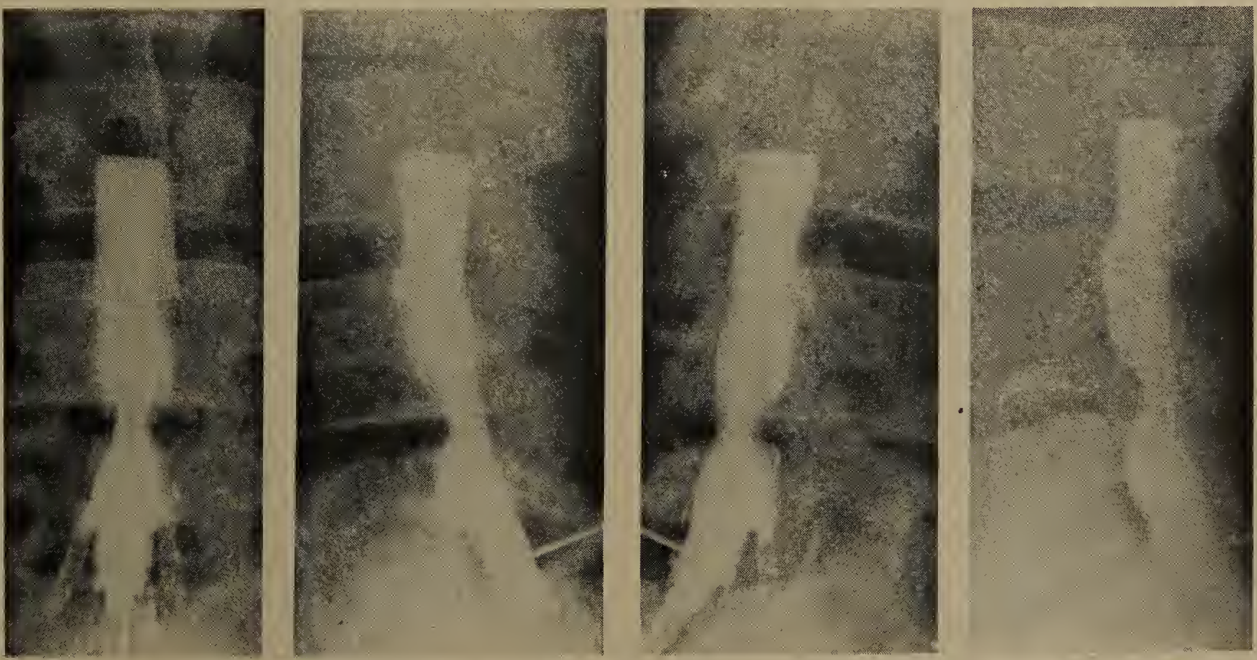

Figure 17.—Symmetrical constriction at the fourth interspace by "ridge defect." Note central and dorsal displacement of the visible nerves of the cauda equina by the localized prominence. This type of abnormality has not been encountered at the lumbosacral interspace.

The Differential Diagnosis of Rheumatism

A Clinical Study of 500 Cases

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SUMMARY

Five hundred consecutive admissions to the rheumatism service of a large hospital were reviewed in an effort to establish criteria for accurate differential diagnosis in rheumatic disorders. Forty-one per cent of the patients presented evidence of articular involvement or arthritis; 28 per cent had non-articular rheumatism, embracing the various types of fibrositis; 7 per cent had musculoskeletal neuroses, and 24 per cent had a variety of diseases unrelated to the musculoskeletal system. A working classification of the various causes of musculoskeletal pain is presented and criteria for the differentiation of the individual diseases are suggested.

"'WHAT is Truth?' asked jesting Pilate, and would not stay for an answer." Thus Sir Francis Bacon begins his famous essay on truth. And were a modern cynic to similarly ask, "What is Rheumatism?" though he did indeed stay for an answer, it is not likely he would receive one. Here truth lies in the fact that "Rheumatism" is not a diagnosis, and is neither a clinical nor a pathological entity, but is a collective term, signifying only that prominent among the complaints of the patient is that of pain in or about muscles or joints. It is a symptom diagnosis, little better than "headache" or "backache" or "sore toe." It states nothing as to the cause of the complaint, nor as to the nature of the underlying pathologic change, and offers little on which to plan a rational program of treatment. Moreover, grave and remediable disorders may masquerade beneath the cloak of rheumatism and be treated symptomatically, often with great detriment to the recovery of the patient, and sometimes to his life.

Once it is recognized that rheumatism is a symptom, and not a diagnosis, the need for differential diagnosis is clear. Although they are historically the most ancient diseases of which we have any pathologic evidence—the hip of the Java Man, who lived 500,000 years ago, showed osteoarthritis—and although in point of causing disability they are exceeded only by neuropsychiatric disorders, the rheumatic diseases have not won the interest and enthusiasm of many physicians. Perhaps because etiology is often uncertain, or because pathologic studies are meagre, or because treatment is viewed with pessimism, this group of diseases has in general been relegated to the position of an unwanted stepchild of medicine. Patients are quick to sense this attitude, and as a result many of them turn to cultists, occasionally with benefit, but often with lasting harm.

This state of affairs is largely our own fault, and could be quickly corrected if more physicians would recognize that differential diagnosis can be just as accurate and just as fascinating in this group of diseases as in the more glamorous fields of cardiology or gastroenterology. It cannot be stressed too strongly that once an accurate differential diagnosis has been made, a therapeutic program can be planned to fit each case, and the results of such integrated treatment will bring as much satisfaction to the patient and to the physician as in any of the more dramatic diseases.

The key to the entire problem lies in the question of differential diagnosis, for in planning treatment it makes a great deal of difference whether the patient has rheumatoid or osteoarthritis, or whether he has one of the manifestations of fibrositis, or whether skeletal pain is of visceral origin or a part of the pattern of an underlying neurosis. Treatment so valuable as to be almost specific in one case may be useless or even harmful in another. Furthermore, the prognosis of the individual disease entities varies widely, and is often the matter of greatest concern to the patient.

In approaching the question of differential diagnosis the physician is immediately confronted with the grim specter of classification. In most medical textbooks will be found two time-honored tables, one "The Classification of Arthritis" and the other "Differential Diagnosis of Rheumatoid and Osteoarthritis." Valuable though these are, they are inadequate to meet the diagnostic problem presented by a patient with a backache or a painful shoulder. What is needed is a simple group of pigeonholes into which all skeletal complaints can be fitted, followed by a further breakdown into disease entities.

As a preliminary approach to this problem. the records of all admissions to the rheumatism service of the U. S. Veterans' Hospital, Wood, Wisconsin, were reviewed, and the final diagnosis determined in each case. Then the histories, physical findings, and the results of laboratory and x-ray examinations were analyzed and tabulated, in an effort to develop criteria whereby a simple classification could be evolved. During the period from January 1, 1947, to March 15, 1948, 500 patients were admitted to

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the service because of musculoskeletal complaints. It was found that all of them could be classified into the following four main groups:

Group I.	Articular rheumatism	207	41%
Group II.	Non-articular rheumatism	138	28%
Group III.	Psychogenic rheumatism	37	7%
Group IV.	Non-rheumatic diseases	118	24%
Total		500	100%

It will be seen that of a group of 500 consecutive unselected patients with "rheumatism," less than half had any form of arthritis, and in nearly one-third the cause of the complaints was entirely unrelated to the musculoskeletal system. These figures illustrate the inadequacy of symptomatic treatment in this group of patients, and the value of accurate diagnosis. This will be emphasized even more strongly when the disease entities embraced in each of the four groups are considered.

Group I—Articular Rheumatism

This group comprises those patients who actually have some form of arthritis. A diagnosis of arthritis should not be made unless there is objective evidence of joint disease, such as signs of local inflammation, periarticular swelling, effusion into the joint, crepitus, or limitation of motion. Pain in a joint, without evidence of articular involvement, should be classed as arthralgia, and may occur in a variety of disorders, rheumatic and non-rheumatic. While many varieties of arthritis have been described, for practical purposes the 207 cases in this series could be satisfactorily classified under only six divisions, as shown in Table 1.

TABLE 1.—*Classification of Articular Rheumatism (Arthritis)*

Diagnosis	Cases	% of Group	% of Series
1. Rheumatoid arthritis	99	48	20
2. Osteoarthritis	74	36	15
3. Infectious arthritis	5	2	1
4. Gout	14	7	3
5. Rheumatic fever	13	6	2
6. Charcot joint	2	1	....
Total	207	100%	41%

All of the patients in this group showed objective evidence of joint involvement, as previously described. Rheumatoid and osteoarthritis together constituted 84 per cent of the cases of arthritis, with the rheumatoid group predominating.

1. *Rheumatoid arthritis.* The 99 cases in this group were further classified, according to the type of involvement, as follows:

(a) Rheumatoid arthritis (peripheral joints)	61
(b) Rheumatoid spondylitis	27
(c) Reiter's syndrome	9
(d) Palindromic rheumatism	2
Total	99

(a) Rheumatoid arthritis involving peripheral joints: In these patients evidence of joint involvement consisted of periarticular swelling, effusions into the joint spaces, muscle atrophy and limitation of motion, the latter due to muscle spasm in acute cases, and fibrous or bony ankylosis in those of long standing. In addition, evidence of the constitutional nature of the disease was generally present, such as fever, weight loss, malaise, asthenia, occasionally leukocytosis, and almost invariably an elevation of the sedimentation rate. The population from which this series was taken was almost entirely male, and it was noted that the classic symmetric involvement of the hands, with fusiform fingers, was seen less often than in the female, while involvement of the smaller joints of the feet seemed much more common.

(b) Rheumatoid spondylitis: The unusually high incidence of spondylitis in this series, almost half that of peripheral rheumatoid arthritis, is explained by the great predominance of males, in whom this disease is approximately twenty times as frequent as in females.[2] The most important objective evidence included limitation of motion of the lumbar spine, which was usually flattened, failure of reversal of the lumbar curve on forward flexion, diminished chest expansion and vital capacity, elevation of the sedimentation rate, and x-ray evidence of inflammatory or destructive changes in the sacro-iliac joints. In long-standing cases additional x-ray evidence was present, with the "bamboo spine" and calcification of the anterior spinal ligaments. Spinal fluid abnormalities were rarely found. This disease is one of the most commonly overlooked causes of backache, particularly in young males. The diagnosis can usually be made on physical examination alone, and is very important, because deep x-ray therapy gives excellent results if used before irreversible changes have occurred.

(c) Reiter's syndrome. This consists of the triad of non-specific urethritis, associated with purulent conjunctivitis and arthritis, and sometimes with gastro-intestinal disturbance. It is still a question whether this represents a disease entity, or whether the non-specific infection acts as a trigger mechanism, precipitating an atypical rheumatoid arthritis. The course is milder, and joint residuals less frequent. Recent work[3] has suggested that pleuropneumonia-like organisms may be related to this syndrome, and that streptomycin may be effective. Penicillin and sulfonamides are of no value, as in rheumatoid arthritis, but in sharp contrast to gonorrheal arthritis, with which it is most commonly confused. The distinction is extremely important, because of the favorable results obtainable with antibiotics in the latter, especially when used early.

(d) Palindromic rheumatism. This disease, first adequately described by Hench,[7] is characterized by recurrent episodes of acute arthritis, often over many years, with normal joints between attacks, and without the residual effects in the joints expected after recurrences of typical rheumatoid arthritis. The pattern is suggestive of gout or of an allergic state, yet the frequency with which women are affected, and the absence of hyperuricemia, make the former diagnosis untenable. A relation to allergic reaction, though suggested, has not been proved. Since typical rheumatoid arthritis eventually develops in some patients with this pattern, many observers feel it is merely a variant of that disease, and it is so classified here.

2. *Osteoarthritis.* This occurs in two main forms, generalized and traumatic, and in this series had the following incidence:

Generalized osteoarthritis	52
Traumatic osteoarthritis	22
Total	74

Generalized osteoarthritis is seen chiefly in individuals past the age of 40, and may be regarded as one manifestation of the aging process, with the joints gradually wearing out with use and particularly with overuse. Thus it is more common in the weight-bearing joints, particularly the knees, hips, and spine, and in the fingertips, where it gives rise to the classical Heberden's nodes. The additional burden which obesity, faulty posture, or congenital deformities impose on the weight-bearing joints accounts for the frequent association of osteoarthritis with these defects and affords a clear-cut indication for appropriate therapy. Objective findings in the joints consist chiefly of minimal periarticular swelling, crepitus, and occasionally bony block by impingement of osteophytes. Ankylosis does not occur, except occasionally in the spine by fusion of osteophytes on contiguous vertebrae. This is an extremely important point in prognosis. Often reassurance that ankylosis, crippling and deformity will not occur is more important to the patient than any other aspect of treatment.

In addition to the local joint findings described, the diagnosis of osteoarthritis is based on the age of the patient, usually past 50, frequent coexistence of obesity or postural strain and the absence of constitutional manifestations, such as fever, anemia, leukocytosis, or elevation of the sedimentation rate. In traumatic osteoarthritis the joint has been damaged by such factors as a severe blow or wrench, a fracture into the joint, repeated subluxations, or the trauma incidental to certain occupations involving excessive use of certain joints. A form of great clinical importance is cervical osteoarthritis. In this region the osteophytes frequently impinge on the nerve roots of the cervical or brachial plexuses, often causing bizarre symptoms of headache, painful shoulders, and radiating pains in the arms, which are readily misinterpreted if the underlying pathologic change is not recognized.

In this connection one important diagnostic error must be stressed. In a patient past 40 complaining of backache, the roentgenological demonstration of lumbar osteophytes is not a sufficient explanation of the backache, inasmuch as osteophyte formation is not necessarily abnormal at this age. It is not unusual for a patient to have a pyelogram for hematuria, or a plain film of the abdomen for an acute abdominal emergency, and have the roentgenologist report an incidental finding of lumbar osteoarthritis, often very marked. Yet frequently these patients have never complained of backache. Similarly it is not uncommon for a herniated intervertebral disc to be overlooked for years, because the physician accepts the x-ray report of "hypertrophic arthritis" as an explanation of the patient's symptoms. Lumbar osteophytes are usually painless, unless traumatized, and it is imperative to rule out all other possibilities before accepting that diagnosis as an explanation for back pain.

3. *Infectious arthritis.* In this series there were only five cases representing actual infection of a joint. One patient had long-standing tuberculosis of the cervical spine. Two had suppurative arthritis of the hip joint; in one case the disease followed rupture of the appendix, and in the other the origin was unknown. Two patients had gonococcal arthritis of the knee.

The great decrease in actual joint infections reflects the decreasing incidence of tuberculosis and the effectiveness of antibiotics and sulfonamides in preventing septicemia. Gonorrheal rheumatism, once so common, is now a rare disease, and is diagnosed more often than it actually occurs. Since gonorrheal arthritis represents a metastatic implant of organisms in the synovial membrane, it must be preceded by bacteremia, and hence is most likely to occur shortly after acute gonorrhea inadequately treated or after instrumentation or prostatic massage in the course of chronic gonorrhea. So-called chronic gonorrheal rheumatism is usually rheumatoid arthritis in which the genital infection served as a trigger-mechanism precipitating the attack, just as other infections may.

Whenever a joint infection is suspected, it is important to examine synovial fluid if present, because it is sometimes possible to recover and identify the causative organism. The character of the exudate is also important, since grossly purulent exudate may suggest the possibility of suppurative arthritis, such as may arise from rupture of osteomyelitis into the joint space. In such a case the glycolytic ferment of the polymorphonuclear cells may lead to a rapid dissolution of hyaline cartilage and to irreversible joint damage. One of the most serious errors made in the diagnosis of joint disease is failure to recognize suppurative arthritis and neglecting specific treatment or surgical drainage until the joint is hopelessly damaged.

4. *Gout.* This has been described[8] as an almost forgotten disease. In a typical case, however, the diagnosis is usually thought of and easily made. Classic involvement of the metatarsophalangeal joint of the great toe in an obese middle-aged male of convivial habits is readily recognized. Unfortunately many, and indeed, most cases do not follow this pattern. Gout is believed to be one of the inborn errors of metabolism, and hence is a lifelong disease which is usually not clinically manifest before the age of 40. Recent experimental work[9] has suggested that hyperuricemia is due to an excess of a "bound" form of uric acid in the blood, and thus may represent deficiency of an enzyme capable of splitting

off this bound fraction. This theory would help explain the lack of correlation between the uric acid level and the clinical picture, and may explain the action of colchicine.

The diagnosis of gout rests on four main features, (1) acute arthritis, (2) hyperuricemia, (3) a characteristic pattern consisting of repeated episodes of acute attacks, which leave no residuals, with normal joints between attacks, and (4) the presence of tophi. When a patient is seen in the first attack all other features may be lacking except the acute arthritis. For this reason gout must be suspected in all cases of acute arthritis in the male, regardless of the joint involved. The diagnosis is strengthened if the arthritis develops postoperatively, or when there is a history of such precipitating factors as injections of vitamin B complex, liver extract, ergotamine tartrate, or mercurial diuretics.

In this series gout comprised 7 per cent of the cases of arthritis. Many of the patients had been admitted previously with such diagnoses as rheumatic fever, rheumatoid arthritis, sprained ankle, or stubbed toe. It is important to recognize this disease, because the treatment is very different from that of arthritis, restriction of high-purine foods is advisable, a specific—colchicine—is available and very effective during the acute attack, and finally because of the favorable prognosis.

5. *Rheumatic Fever.* The cases of rheumatic fever in the series all represented diagnostic errors, since when it was recognized on admission the patients were sent directly to the cardiac service. The patients were usually admitted with the diagnosis of "acute arthritis," an unsatisfactory term since, on study, the disease may prove to be acute rheumatoid arthritis, traumatic synovitis, gout, a joint infection, or rheumatic fever. The differentiation of rheumatic fever and acute rheumatoid arthritis is often very difficult, and in some cases can be made only after several weeks of observation.[4] Factors favoring a diagnosis of rheumatic fever are (1) a history of previous rheumatic fever, (2) evidence of active carditis, or the presence of rheumatic valvular disease, (3) prompt response to salicylates, and (4) the transient migratory character of the arthritis. Most important in the diagnosis of rheumatoid arthritis are (1) persistence of joint involvement, (2) the development of residual periarticular thickening, swelling, and limitation of motion. Other evidences, such as fever, leukocytosis, elevation of the sedimentation rate, subcutaneous nodules, and a history of preceding streptococcal infection, may be seen in both diseases, and are of little help in distinguishing them. X-ray studies are negative in rheumatic fever, except for soft tissue swelling; and in rheumatoid arthritis usually several months must elapse before the characteristic x-ray changes are demonstrable.

6. *Charcot Joint.* Two cases of Charcot joint were recognized. Both were associated with the clinical and spinal fluid changes of tabes dorsalis. Both involved the knee joint, although any joint may be affected. The large boggy joints, with the "bag of bones" feeling, crepitus, and the characteristic x-ray picture showing disintegration of the joint, make diagnosis easy if the disease is considered.

Group II. Non-Articular Rheumatism

This group comprises those patients whose complaints were chiefly referrable to the white fibrous tissues of the body rather than to the joints themselves. The fashionable term for this disease is fibrositis, and involves the concept that the various connective tissues, the fascial planes, intramuscular and perineural septa, tendon sheaths, bursae, and joint capsules may be affected by a non-suppurative type of inflammation. While the pathologic evidence supporting this view is not entirely convincing, nevertheless fibrositis is a distinct clinical entity and can frequently be diagnosed from the history alone. The patients complain of aching and stiffness of muscles and joints, usually worse on arising or after prolonged sitting—the so-called "jell" phenomenon. They limber up and improve with exercise, but with fatigue their complaints recur late in the day, thus giving a "dicrotic curve" of symptoms. Their complaints are aggravated by chilling and dampness, and relieved by heat, such as a hot tub bath or shower. They are the weather prophets and often claim the ability to foretell storms and inclement weather. They usually claim that their complaints are worse in the winter and spring months, although in this series the greatest number of admissions was in June, July, and August.

The chief features in the diagnosis of fibrositis are the characteristic history, often indicative of disease of many years' duration; the absence of objective evidence of peripheral joint involvement, although arthralgia may be present due to periarticular fibrositis or "capsulitis"; and the absence of constitutional manifestations. In most cases the sedimentation rate is normal, although it may be slightly elevated. In the generalized form of fibrositis a characteristic finding is the presence of fibrositic nodules, which vary in size from that of a pea to that of a quarter and may be felt as "trigger points" deep in muscles, chiefly in interscapular, lumbar, and gluteal areas, and about bony prominences, especially over the sacroiliac areas. Pressure over these tender nodules may reproduce the patient's complaints, including various radiating or sciatic pains. Frequently the local infiltration of these trigger points with procaine solution will give dramatic and gratifying relief.

In this series there were 138 cases classed as non-articular rheumatism, or 28 per cent of the total admissions. Of this group the following types were recognized:

Types of Non-Articular Rheumatism

Generalized fibrositis	102
Painful shoulder	27
Shoulder-hand syndrome	8
Acute myositis	1
Total	138

Generalized fibrositis was thus the most frequent single diagnosis made. The term "painful shoulder" included such localized forms of fibrositis as periarthritis of the shoulder, "frozen shoulder," subdeltoid bursitis, and supraspinatus tendinitis. An important diagnostic point is the fact that in no instance was monarticular involvement of the shoulder joint due to localized arthritis of the shoulder. The shoulder-hand syndrome, recently described,[1] consists of periarthritis of the shoulder, usually the left, with pain, tenderness, and limitation of motion, often associated with swelling of the small joints of the hand and fingers on the corresponding side. This interesting condition is most frequently seen following myocardial infarction. In only one instance in this series was the diagnosis of acute myositis made. This is in sharp contrast to the frequency with which this diagnosis is generally used as an explanation for muscular aching and stiffness, lumbago, torticollis, and allied conditions more properly attributable to intramuscular fibrositis. The single case was that of a 22-year-old male who gave a history of several episodes of undiagnosed fever, associated with pain, stiffness, and tender nodules in various muscles, together with leukocytosis, elevated sedimentation rate, and generalized lymphadenopathy, resembling the clinical picture of dermatomyositis except for the absence of cutaneous involvement.

Group III. Psychogenic Rheumatism

Thirty-seven patients, 7 per cent of the total, were considered to have some form of psychogenic rheumatism. Prior to World War II the frequency with which musculoskeletal complaints might occur as a manifestation of neurosis was not generally appreciated. During the war, however, the experience of many observers in military and naval hospitals seemed to indicate that approximately 20 per cent of patients admitted for rheumatic complaints had no objective evidence of musculoskeletal or other organic disease, and presented clear-cut evidence of neuropsychiatric disorder, ranging from mild neurasthenia with vague aches and pains to full-blown conversion hysteria, with bizarre hyperasthesias and anesthesias, eccentric gaits and postures.

In making a diagnosis of psychogenic rheumatism, positive as well as negative evidence is necessary. The diagnosis may be suspected when objective evidence of musculoskeletal involvement is absent, or when the symptoms are greatly out of proportion to the findings. In addition there will usually be present multiple associated complaints referable to other systems of the body, headaches, palpitation, functional digestive complaints, tremors, sweating, and most important, a psychiatric background of maladjustment often going back to childhood. In several instances sodium amytal interviews were very helpful in evaluating these patients. A common error is to classify these cases as examples of fibrositis or muscular rheumatism. This is unfortunate, because treatment directed to the musculoskeletal system alone is not only unsuccessful, but may be harmful in that it tends to fix the neurosis more deeply, and serves to increase the preoccupation of the patient with the symptoms rather than with the solution of the causative factors. Many observers have noted the uniformly poor response of these patients to drug or physical therapy, and have contrasted it with the usually favorable response of the fibrositic group. Some[5] have suggested that this is a valuable point in differential diagnosis, pointing out that the patient with fibrositis is affected by changes in his external environment, while the one with psychogenic rheumatism is similarly at the mercy of his internal, or emotional environment. It is important to recognize these patients promptly, because the therapeutic failure which will invariably follow an erroneous diagnosis will bring discredit to the physician and prolong the disability of the patient.

Group IV. Non-Rheumatic Diseases

One hundred eighteen patients, nearly one-fourth of all those admitted to the rheumatism service in this series, had pain in the musculoskeletal system due to various causes originating entirely outside that system. These were further classified according to the following table:

Non-Rheumatic Diseases

General medical disorders	31
Orthopedic disorders	34
Disc syndrome	31
Neurological disorders	13
Osteoporosis	5
Allergic disease	4
Total	118

The wide range of causes of pain simulating rheumatic disease is at once apparent and again emphasizes the importance of careful study. All of these 118 cases represent errors in diagnosis, most of which were due to neglect of the two cardinal principles previously emphasized: (1) a diagnosis of rheumatism should not be based solely on the presenting complaint of pain, and (2) a diagnosis of arthritis should never be made in the absence of objective evidence of joint involvement.

The most common error was failure to recognize peripheral vascular disease, and the attribution of the cramps of arterial insufficiency to muscular rheumatism or the pain and swelling of thrombophlebitis to arthritis. One patient with thrombosis of the axillary vein was admitted as having acute arthritis of the shoulder. In two instances in which the presenting complaint was shoulder pain the underlying myocardial infarction had not been recognized. Among the orthopedic group were examples of Perthe's disease, Osgood-Schlatter's disease, spondylolisthesis, and congenital deformities, notably shortening of one leg. One patient admitted with the diagnosis of arthritis of the shoulder actually had a complete anterior dislocation of the humeral head.

Of the 31 patients who had the "disc syndrome," consisting of low back pain with gluteal or sciatic radiation, about half were subsequently shown, by myelography or at operation, to have a ruptured intervertebral disc. Several of these cases had gone unrecognized for years, and as mentioned above, in some a ruptured disc was not suspected because the physician accepted the diagnosis of hypertrophic arthritis, based on the presence of lumbar osteophytes.

Among the cases of neurological disease were four in which there was intracranial injury or neoplasm, two with meralgia paresthetica, and examples of Parkinsonism, myotonia, intercostal neuralgia, and syringomyelia. The pains, paresthesias, or deformities of the neurological disease were attributed variously to arthritis or neuritis, chiefly because a neurological examination had not been performed.

In the four cases of allergic disease there were transitory joint swellings in allergic individuals, resembling serum sickness, and associated with urticaria or angioneurotic edema. In one instance the symptoms followed the administration of penicillin.

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Neck and Shoulder Pain

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SUMMARY

Neck and shoulder pains are presenting or incidental symptoms in a large variety of conditions.

There may be similarities in the anatomico-physiological mechanism of pain production and in the clinical picture in many of these conditions.

Many of the vague and refractory cases of neck and shoulder pain and of migraine may be due to cervical disc disease.

Scalenus anticus syndrome and cardiac disease can be diagnosed or differentiated from cervical disc syndrome only by thorough investigation.

Proper treatment of neck and shoulder pain is dependent upon correct diagnosis through complete history, physical examination and laboratory tests, as described in this presentation.

IN the differential diagnosis of pain in the neck and shoulder, experience may be fallacious and judgment difficult. The pain may be simply an annoyance or a symptom of serious disease. Too often, because of inadequate examination and incomplete diagnosis, the patient receives everything from aspirin to balneotherapy, from colonic lavage to dental extraction, diathermy, diets, vitamins and/or operation. These patients wander from physician to physician, and often to cultists—and still the pain persists.

In some instances pain is present in one shoulder only; in others it may be bilateral or associated with neck pain on one or both sides. These multiple pains may be unrelated or they may result from the same underlying process. Opinion as to the frequency of various causes varies with the source of the opinion. The orthopedist, cardiologist, neurosurgeon and physician in general practice present different statistics.

SCALENUS ANTICUS SYNDROME

The syndrome of pain and altered sensation in the neck, shoulder, and C8-T1 dermatomes due to scalenus anticus hypertrophy and spasticity was described by Ochsner, Gage, and DeBakey[29] in 1934. These changes may be associated with vascular and vasomotor phenomena, and/or muscle weakness sometimes amounting to complete paralysis of the extensor muscles of fingers and wrist.

It is probable that any disease process of the cervical spine or shoulder region may produce secondary spasm of the scalenus anticus with resultant compression of the subclavian and possibly brachial plexus, subclavian vein and sympathetic trunk. Elevation of the first rib resulting from this muscle spasm may further increase the pressure on these structures. Several interesting theories have been put forward to explain the muscle spasm, pain, and other symptoms. Todd[39] suggests that high fixation of the first rib due to inadequate descent of the sternum results in brachial plexus irritation; while Jones[17] believes that the first rib compresses the dorsal nerves joining the lower cord of the brachial plexus. Aynesworth[4] states that traumatic myositis is the chief factor in the production of spasm. Swank and Simeone[37] speak of an upper type in which there is pressure by the scalenus anticus tendons on the nerve roots of C5-6-7; and a lower type where there is a "squeeze" of C8 and T1 cords by the scalenus anticus and medius muscles. Gage[12] and his group support this last concept, basing their support on anatomical studies. However, Nachlas[27] and others feel that in most cases the scalenus anticus syndrome is secondary to cervical intervertebral disc abnormalities.

It is usually possible to differentiate clinically between the so-called upper and lower types of scalenus syndrome, as described by Swank and Simeone.[37] The more common lower type presents signs and symptoms due primarily to pressure on C8 and T1 roots and is characterized by the gradual onset of pain, muscle weakness and paresthesia. Mild to severe neck pain aggravated by pressure on the scalenus anticus is a constant finding; less commonly, pain along the medial-ulnar aspect of arm, forearm, hand, and ring and little fingers is present. Paresthesia, numbness, and diminished sensation to light touch and pin prick are found in the same regions. Weakness and atrophy of the intrinsic muscles of hand, ring and little fingers may be present. Sphygmomanometric readings show a diminution in arterial pulsations of the arm. Because obliteration of the radial pulse on turning the head to the affected side appears often in normal persons, this sign is not of diagnostic value.

The injection of novocain into the muscle usually relieves the spasm, pain, and other associated symptoms.[18]

The manifestations of the upper type of anticus syndrome are due to irritation of C6-7 roots with sudden severe weakness of the extensors of the wrist and fingers with paresthesia and reduced sensitivity of the thumb and index fingers, without pain or muscle spasm. Some patients do not have muscle weakness or sensory change, but muscle spasm and pain predominate in certain areas—namely, neck, tip of shoulder, posterior axillary fold, dorsum of upper arm, and extensor surface of the forearm.

Careful examination, and especially the novocain test, will differentiate between scalenus spasm, the syndromes described by Wright[46] (pectoralis minor pressure), by Falconer and Weddell[10] (costoclavicular narrowing), and Raynaud's syndrome.

Irrespective of etiological concepts of the syndrome, conservative therapy is indicated and usually gives relief. Rest of the upper extremity, correction of poor posture,[40] change of occupation, massage, and novocain injection[18] should be tried. Diathermy is recommended by Griffith.[13] Nachlas[27] obtained relief for many patients by traction on the cervical spine by the use of either a halter or tongs. The authors have observed good results with this technique.

Scalenotomy, introduced by Naffziger[28] in 1934, is too often unsuccessful. It will not eliminate pain and paresthesia resulting from disc disease, but only that caused by vascular disorders due to compression of the subclavian artery by the spastic, hypertrophied muscle. Before scalenotomy is undertaken, disease of the intervertebral discs must be ruled out.[30]

CERVICAL RIB

Lister was one of the first to excise a cervical rib. In 1905, the cervical rib syndrome was described by Murphy,[26] and in 1927 Adson and Coffey[1] relieved the pain and associated symptoms in this condition by scalenotomy.

Cervical rib, or elongated transverse process of C7 vertebra, the presence of which often is determined by routine roentgen examination, usually does not produce shoulder pain or other abnormal findings. In some cases there may be actual pressure by the cervical rib or enlarged transverse process on the brachial plexus and/or subclavian artery, producing a symptom-complex similar to that of scalenus syndrome.[8] In these few cases, scalenotomy or excision of the rib may give relief, but this will be unavailing in cases in which symptoms are due primarily to disease of the discs.[30]

CERVICAL DISC SYNDROME

Following the classical work of Schmorl, in 1928 Stookey[36] described cervical disc herniation, reporting six cases with cord compression and one with nerve root compression. Hawk[14] in 1936 was able to find reports of only 36 such cases in the entire literature. However, in recent years, many cases have been reported. Saunders and Inman,[31] in work on cadavers, found a high percentage with some degree of posterior herniation. The ratio of cervical disc herniation to lumbar disc herniation has been reported by Naffziger and Boldrey[28] at about 2-3:100. At Walter Reed General Hospital in a nine-month period, there were 143 herniated lumbar and 12 (8.3 per cent) cervical discs. The statistics of Raney[30] at Los Angeles County General Hospital favor the higher percentage.

The intervertebral disc in the cervical region is anatomically analogous to that in the lumbar region and is subject to the same changes. Although the cervical discs support less weight and are subject to less trauma, they are narrower and more delicately constructed and are involved in a greater range of mobility.[38] As in the lumbar spine, herniations are most common at the level of greatest strain and through the weakest point in the annulus.[29] Discs 5 and 6 are usually involved with posterolateral herniations. Since the cervical canal is more nearly filled with nerve tissue than either the dorsal or lumbar region, even a small intraspinal mass causes earlier and more localized symptoms. The cervical root emerges from the dura to enter the intervertebral foramen at a right angle and lies immediately over the corresponding intervertebral disc. Thus the root may be compressed against the ligamentum flavum, pedicle, lamina, or facet by a posterolateral protrusion of the disc without involvement of the spinal cord.

Midline protrusions with pressure on the cervical cord present a picture likely to be confused with that of intraspinal neoplasms. In these cases the patients frequently give a history of minor trauma such as the sudden stopping of an automobile or a fall, followed by recurring neck stiffness, and pain in shoulders and arms aggravated by sudden movement of the head and neck. There is often tenderness over the spinous process at the level of protrusion, increased protein in the spinal fluid, and partial block as revealed by myelography. In this condition, prompt surgical operation is required. Of interest is another complication of disc displacement reported by Kahn,[21] who presented three cases with the denticulate ligament traction and resultant damage to the lateral columns causing lateral sclerosis.

Posterolateral protrusion of the disc causing pressure on the cervical roots, without cord involvement, is being more frequently recognized as a cause of neck and shoulder pain. As has been said, this was formerly diagnosed as scalenus anticus syndrome, and scalenotomy was ineffective. Semmes and Murphey[33] have presented a clear description of this condition. Trauma is not an essential precursor. The usual history is that of stiffness of the neck and pain for months or years.[9] The pain may be cervical, shoulder tip, between the scapulae, precordial, or across the chest.[11] It may be suboccipital and be diagnosed as "migraine." [30] Sudden extension of the neck, coughing, sneezing, or straining may aggravate the pain and produce an "electric shock" pain shooting into the little finger of the affected side. There may be numbness and paresthesia of the thumb, index, and middle finger which are more aggravating than the pain. Often the pain and paresthesia are made worse when the patient remains in one position for any length of time. Such a patient may have to get out of bed and walk about several times during the night in an effort to obtain relief. There may be associated vascular symptoms manifested by numbness, coldness, and blueness due to subclavian artery compression by the scalenus anticus, reflexly in spasm because of root irritation.

The patient usually holds the affected shoulder elevated, and the head tilted forward or toward the unaffected side. There may be spinal tenderness at the site of the lesion; and percussion on the painful side, just lateral to the cervical spines, may reproduce the symptoms. Tilting the head and neck toward the painful side, "neck compression test," and pressure on the head will intensify the pain, whereas tilting away from the painful side, or traction, will relieve the symptoms. In many cases there are tenderness, weakness, or wasting of the pectoralis major, triceps, and extensors of the wrist and fingers. Roentgenograms will show a straightening of the involved region with absence of normal cervical lordosis, and diminution of intervertebral distance.[44] Oblique views may show narrowing of the intervertebral foramen with osteophyte formation. However, these findings are not pathognomonic. Myelography is advocated by most workers to verify the diagnosis.

In cervical disc herniation, with root compression only, conservative therapy in the form of halter traction may give permanent relief.[30] If the patient is comfortable in traction, but the pain recurs mildly when weight-bearing is resumed, Spurling[34] suggests a well-fitting cervical collar. Forcible manipulation in the presence of disc herniation is a dangerous procedure. There have been several recent reports of permanent damage to the cord due to manipulations. If there is pressure on the cord, or if the lesion is suspected of being a large one, or if pain and muscle spasm persist after several days of traction, operation is indicated. Recovery after operation is more complete and more rapid than for patients operated upon for lumbar disc herniation.

CERVICAL ARTHRITIS

Uncomplicated cervical arthritis is an uncommon cause of neck and shoulder pain. Of greater significance is nerve root pressure due to narrowed intervertebral foramina secondary to arthritis. These bony changes may be a generalized process due to old age or to rheumatoid arthritis, or, more commonly, to a local condition resulting from a damaged intervertebral disc. Keyes and Compere[22] in 1932 described this latter condition and reproduced the lesions experimentally in dogs. Turner and Oppenheimer[42] of Beirut in 1936 reported 50 such cases. Faulty posture may produce muscle-ligamentous strain in the cervical region[40] and predispose to chronic arthritis. The influence of local trauma and therapy has been discussed under cervical disc syndrome.

NEURITIS AND "RHEUMATISM"

For want of a better diagnosis, neck and shoulder pain is often labeled by the physician as neuritis, neuralgia, fibromyositis, or "rheumatism." The terms neuritis and neuronitis should be reserved for a specific entity of nerve inflammation due to trauma, toxic absorption, infection or metabolic disease. Pain and tenderness may be elicited along the course of nerves and the symptoms are not aggravated by head and neck motion. Brachial neuritis may also occur secondary to cervical disc disease, osteoarthritis of the dorsal or cervical spine, scalenus anticus spasm or hypertrophy,[19] cervical rib, or intraspinal lesions. Some of these conditions are considered elsewhere in this presentation. With "rheumatism" there is usually tenderness of the involved muscles as well as in other areas. Pain and the extent of disability are often difficult to evaluate and psychogenic possibilities must be considered. Elimination of focal infections is usually of little value. Salicylates, large doses of thiamin, massage, diathermy, or novocain infiltration sometimes gives relief. Work with poliomyelitis indicates that curare in oil[32] or neostigmine[20] may prove of value in these cases.

BURSITIS

The most common cause of isolated shoulder pain is probably subacromial bursitis secondary to lesions of adjacent capsule, tendon or joint. Rupture or calcification of the supraspinatus tendon is often the primary lesion. Armstrong[2] collected reports of 89 such cases and described three cardinal signs: (1) a painful area between 60 and 120 degrees on abduction of the humerus, due to impingement of supraspinatus tendon of the covering bursa against the overlying acromium; (2) reversal of normal scapulohumeral rhythm due to reflex muscle spasm; (3) tenderness on deep pressure over the supraspinatus tendon. Toumey[41] has pointed out that the pain is worse at night and may affect arm, scapular region, and neck. The pain may lead to disuse, adhesions, muscle atrophy, and limitation of movement. Codman[7] believes that the bursa is more sensitive to pain than any of the surrounding structures. Surprisingly little is found at surgical operation in these cases even in the so-called "frozen" shoulder (periarthritis, or tendinitis).[45]

In most cases, bursitis, even with calcification in bursa or tendon, responds to conservative therapy.[45] This does not mean immobilization in abduction, which leads to adhesions. Heat, curare,[20] diathermy, regulated exercises, and roentgen therapy have their advocates. Novocain or saline infiltration, especially by the two-needle technique, should be tried. Manipulation under anesthesia or the hyperabduction treatment of Codman[7] may be necessary for breaking down adhesions. Wilson[45] favors manipulation after procaine infiltration of the bursa, followed by diathermy. Large calcifications may necessitate excision. Armstrong[2] stated that one-third of his patients required acromionectomy, but this appears to the authors to be unwarranted except in a few selected cases. Stellate ganglion block often gives relief when other measures have failed.[6]

CORONARY INSUFFICIENCY

In coronary artery disease or in myocardial infarction, pain in the neck or in either shoulder may occur with or without substernal distress. The origin of pain in coronary insufficiency appears to be due to lack of oxygen in the heart muscle. In the usual case of angina pectoris or of myocardial infarction the source of the shoulder pain is obvious. A more difficult problem is encountered when shoulder pain is the only symptom of coronary artery disease or when shoulder pain occurs as a sequel to myocardial infarction. In the former situation the true cause of the pain may not be suspected; and in the latter the relationship between the infarction and the subsequent shoulder disability is usually misinterpreted as being coincidental.

The exact route for cardiac pain impulses has not been established. Probably most of the impulses are transmitted by way of the middle and inferior cardiac nerves to the cervical ganglia, down the sympathetic chain through the white rami communicantes and dorsal roots to the cord levels of T1 to T4. These impulses are transmitted up the cord by the lateral spinothalamic tract of the opposite side to the thalamus and cortex. In the cord, perhaps in the substantia gelatinosa or possibly in the dorsal roots, the cardiac pain impulses are projected to the dermatomes of the related afferent somatic nerves. Areas represented by these dermatomes include the precordial and pectoral regions, the inner aspect of the left arm and forearm down to the tip of the little finger, and the ulnar side of the ring finger.

The most acceptable explanation of shoulder pain in these cases is that of overflow of impulses, or accessory visceral or somatic neurons. The existence of accessory pathways has been suggested by the studies of White,[43] and others. As Heinbecker[15] pointed out, painful impulses may be carried from the cardiac plexuses by accessory afferent sympathetic fibers to the cervical cord and referred to the shoulder region to which the cord is linked through nerves. According to Miller,[25] accessory afferent somatic fibers may exist in the lower cervical nerves and gain entry into C8 and T1 segments of the cord; thereby, the shoulder is brought into relation with a common intraspinal zone for the mediation of cardiac pain. This bidirectional conduction explains the occasional bizarre transmission from the shoulder dermatome into the precordium and the possibility of simulating "angina pectoris" by stimulation anywhere along the course of the involved nerves. Leriche[23] reproduced precordial pain by electrical stimulation of the left stellate ganglion. Bauer[5] goes so far as to state that certain cases reported as herniation of lower cervical discs simulating angina pectoris were true cases of angina pectoris. Imperati and his co-workers[16] reported two such cases, ascribing the pain to cervical arthritis secondary to disc disease. Libman[24] wrote of "rebounds in the autonomic nervous system." He attributed shoulder pain following myocardial infarction to a "gouty state" resulting from lipoid metabolic disturbance and hepatic dysfunction which he considered basic in coronary artery disease and coronary thrombosis. Such a concept might explain the right shoulder, right hip, and ankle pain in several cases observed by the authors. Askey[3] and others favor this explanation of local changes and a causalgia-like state.

In angina pectoris, shoulder pain,[34] which may be the sole symptom, is usually aching in character and of short duration. It may be precipitated by undue exertion, excesses of eating or drinking, or emotional disturbances. It is relieved by the same measures which control substernal pain of angina pectoris.

Shoulder pain may occur simultaneously with myocardial infarction or it may appear days to weeks after the acute stage of the disease. Initially the pain may be severe, requiring sedation for relief; more commonly the patient will complain of distress only on abduction or internal rotation of the arm. In fact, the shoulder discomfort may be minimal and the clinician unaware of its presence unless the patient is carefully questioned. Pain and disability may persist for months, and the prognosis is uncertain, although outcome is favorable in the usual case. In cases reported by Askey the patients developed shoulder pain and involvement of the hands subsequent to myocardial infarction. The swelling, stiffness, and pain of the hands sometimes preceded the shoulder disability and usually persisted after the disability subsided. The causalgia-like mechanism might explain the phenomena in the hand, but it seems an inadequate explanation for the shoulder pain.

Treatment of this condition is difficult and recovery is usually spontaneous after weeks to months. Passive and active motion of the involved joints should be begun early. Physiotherapy and other usual treatments are of little value.

MISCELLANEOUS

In addition to the conditions discussed, shoulder pain may be produced by local processes or by involvement of the cervical or brachial plexuses, secondary to any of the following: Apical lung tumors (Pancoast syndrome), subclavian arterial aneurysm, tuberculosis of the cervical vertebrae, neurosyphilis, enlarged cervical or axillary lymph nodes, gout, and neurogenic arthropathy (Charcot's disease). Various traumatic lesions of the cervical spine and shoulder girdle may lead to shoulder disability. Referred visceral pain from disease of the gallbladder or diaphragmatic hernia should be considered. Too frequently, despite thorough investigation, the exact cause of the neck and shoulder pain cannot be determined.

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The "Nursing Crisis"

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SUMMARY

Three concrete proposals are made for the improvement of the present nursing situation:

1. *Make nursing education more easily available by holding the prerequisites to a minimum and concentrating upon the real essentials of nursing, granting the student the R.N. degree when she has completed this basic and essential training.*
2. *Utilize more fully the principles of group nursing as applied to "specialing" whether in the home or in the hospital.*
3. *Completely avoid the use of sub-standard nurses, while furnishing to the nurse such non-technical service (through the use of maid assistants or others) as shall make practicable the complete utilization of her skill and training.*

DESPITE the impressive and continuing advances in medical science, medical skill can be effective only insofar as it can be applied to its ultimate object, namely, the sick patient. In this application, the nurse plays an indispensable part. Without her effective cooperation the physician's task may be almost impossible. It is for this reason that the much bruited "nursing shortage" and "nursing crisis" merit most careful and most prayerful consideration.

The nursing profession has been the subject of much and increasing criticism, some of it perhaps justified but much of it grossly unjust. One of the sentiments most commonly expressed is, "The nurse nowadays doesn't really want to nurse; all she wants is a white-collar job. She likes to sit at a desk and be an administrator." Some critics also will say, "Why, in the old days you could get a nurse to work for 20 hours a day. Nowadays, a poor man has to hire three nurses for the 24-hour period, and pay each of them ten dollars or more." These criticisms, just or unjust, touch a very fundamental problem in the nursing situation, namely, the matter of so-called "increasing standards." By this is meant in part the increasing amount of preparatory work required for entrance to nursing school—in many schools one or two years of college and in some cases a bachelor's degree before the student can start her actual nursing training.[1] In addition, there must be considered the numerous lines of specialization opening up for the modern nurse, namely, supervisory work, administration, public health, industrial nursing, office nursing, nursing education, etc. It is perfectly understandable that a nurse who has entered nursing school after from two to four years of preparatory college work, and who after graduation from nursing school has undertaken graduate work, should feel that her time could be occupied to better advantage than in the "toting of bed pans." The real difficulty here would appear to be not so much the amount of graduate training which a nurse may undertake following graduation from nursing school as the work preparatory to her entrance to nursing school, which is becoming increasingly voluminous and demanding.

A somewhat analogous situation appears to be developing in the medical profession where the old-style general practitioner finds himself more and more crowded by specialists and where the newer graduate shows less and less inclination to go into general practice.[2] The essential difference, however, between the medical and the nursing profession appears to be that, in general, specialization occurs after graduation from medical school and after the serving of an adequate internship. This, in essence, makes the young physician a "general practitioner" before he becomes a specialist.

Various solutions have been proposed for the present nursing difficulties. Many of these solutions appear to tend toward the development of a sub-standard nurse, whether she be called practical nurse, nurses' aide, or by other limiting terms. The author believes very strongly that this represents an actual down-grading of the nursing profession and that it is completely opposed to the objectives of those who have been attempting to up-grade the nursing profession by increase in preparatory training and theoretical work. In the author's opinion all nursing should be done by thoroughly qualified nurses, that is to say by registered nurses.

Fishbein,[3] in 1944 wrote: "I remember many years ago the idea that was spread abroad in Chicago by Dr. John Dill Robertson, then Health Commissioner, that we were going to have two kinds of nurses: high-grade nurses, graduated from regular training schools, who would be working in the hospitals and taking care of surgical and obstetrical cases, and then a generally low-grade nurse who could be educated in six months and who would do all the rest of the nursing; both of them would be licensed nurses.

"Then it was discovered that the low-grade nurses would simply wipe out the higher type nurses. The mass of the six-months graduates would lower the whole level of nursing education so promptly that it would just about end high quality nursing."

It is perfectly true that in the past and perhaps even today, many tasks requiring no nursing skill whatsoever have been carried out by nurses. This, undoubtedly, is what is meant by the common phrase "carrying the bed pans." There does not appear to be any valid reason why the nurse cannot have maid service available for this type of work. These maids, however, should be called exactly that: "maids"; they should not be called nor considered "practical nurses" or "nurses' aides," and they should not carry out any nursing procedures whatsoever.

It is perfectly true that present-day nursing procedures and modern advances in medicine require for their application a competent, alert and well-educated nurse. The question may be asked, however, "Is there any reason why the training in nursing school should not be of college or university grade, even if nursing students are accepted from the senior class of high school?" The university accepts high school seniors and finds them perfectly capable of carrying on advanced academic work. Why cannot a high school senior be accepted into nursing training, and after two or perhaps three years of training of college grade, be turned out as a well-educated and thoroughly competent nurse? Of these graduates, of course, some will wish to go on to "higher things." They may wish a bachelor's degree; they may wish to go into nursing education or other specialized fields. In such cases, as the candidates have behind them two or three years of work acknowledged to be of university grade, a longer or shorter period of graduate training should suffice for the attainment of all desired objectives.

In this connection, the following suggestion has been advanced by a correspondent of Claude W. Munger, M.D., professor of hospital administration at Columbia University:[4] "Any high school graduate could be trained for good bedside nursing in 22 months. At the end of that period she should be graduated with the right to register as an R.N. Among a class of graduates there are always those with special aptitudes who should be encouraged to take one or two years of special postgraduate work leading to a degree such as M.N. (Master of Nursing) in the fields of public health, pediatrics, obstetrics, psychiatry, teaching, executive work, or operating room service."

Whatever one may think of the old-fashioned "will to work," the present trend toward shorter working hours and higher wages appears to be irreversible. There is, therefore, no hope for the return of the so-called 20-hour nurse, and this can hardly be otherwise than a blessing whether in disguise or not. As much as one may admire the faithful and at times heroic women who toiled the clock around, there can be no reasonable doubt that such conditions must often have militated against efficiency and accuracy in the care of the sick. If the nurse is to be a real human being, she must be allowed due time for rest, recreation and the humanities. Nevertheless, the case of the patient who could formerly afford to hire one nurse and is now unable to hire three nurses daily calls for solution. Group nursing, whether in the home or in the hospital, appears to provide the solution. It is only the very rare patient who requires continuous and unremitting nursing care. An efficient nurse, given the facilities, can usually care very effectively for two critically ill patients and for three patients not so critically ill.[5] It is possible, thus, for the special nurse to care for three patients in this manner. The patient's expense for nursing care, even over a 24-hour period, is immediately reduced to the old standard of one nurse a day. Proper planning and a suitably organized visiting nurse service could undoubtedly do the same thing for the home patient.

In the hospital, definite administrative problems may be encountered with group nursing. These problems are beyond the scope of the present article, but are all capable of satisfactory solution.

There appears to be real reason for the belief that acceptance of nursing students direct from high school and concentration during the training period upon the real essentials of nursing would go far toward relieving the nursing shortage. Undoubtedly, many students now feel unable to go into the nursing field because of the increased requirements of time and money involved in the training, while others, having spent the required amount of time and money, feel entitled to the so-called white-collar job and the increase in financial returns available to the administrative nurse and the nurse educator.

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ADDENDUM

Since the above article was submitted for publication (April 1948) the views expressed therein have gained some acceptance in nursing education circles. Particular attention is called to: Fidler, N. D.: "The Canadian Nurses' Association's Demonstration School of Nursing," Canadian Medical Association Journal, 60:514-516 (May), 1949. Fidler outlines a project which is described as "a national experiment supported by two national associations" in which students from high school are to be given an intensive training for 25 months, which will eventuate in the R.N. degree. The work is to be of university grade and little or no time is to be spent in the routine care of hospital patients. The universities of Alberta, McGill, Queen's and Toronto have agreed to accept these R. N.'s for graduate work in their nursing schools. Under this system the training hospital, of course, would carry a heavier financial burden in that it would not be receiving free student-nurse services as at present. The author states in this connection, "Student nurses should not be expected to support the school, as in fact they have been doing, in large measure, through their services." This effort toward the streamlining of nursing education may well mark the beginning of a new and profitable trend.

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Potassium Permanganate Soaks in Peripheral Vascular Diseases to Emphasize Nail Growth Changes

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DISTURBANCES of nail growth have long been recognized as indicators of circulatory insufficiency in peripheral vascular diseases.[1, 2, 4] Recently, Edwards[3] again called attention to the various nail growth changes in arterial diseases. He emphasized the contrast between the old diseased nail and the newer more proximal portion as an indicator of circulatory improvement.

Nail growth change has been observed for this reason by the author for some time. It was found that the contrast was not great enough in a considerable number of cases, especially if the nails were slowgrowing, to be of appreciable clinical value. Furthermore, the differences between the individual nails were not clearly defined in many cases.

Potassium permanganate foot soaks were decided upon as a method of staining the nails. Staining the toenails has been carried out in a large number of cases (over 300 patients) and found to be very reliable. The observations resulting have been utilized along with other determinations, such as surface temperature and color changes, in evaluating the clinical status of the patient and the response to treatment.

All patients treated by the author for peripheral vascular diseases are given potassium permanganate foot soaks upon first consultation. Patients are directed to soak the feet in the solution at room temperature for 20 to 30 minutes daily for a period of seven to ten days. The nails are stained a deep, even, black-brown color which persists for months. New nail growth from then on is strikingly contrasted and clearly outlined. Measurements of the rate of growth are facilitated and differences in rate of growth in the nails of the individual toes are revealed. The correlation between nail growth and other symptoms of arterial disease, such as pain, coldness and paresthesias, is great.

Two additional advantages are obtained with the potassium permanganate soaks:

(1) The new nail growth, or lack of it, is so clearly demonstrated to the patient that cooperation in carrying out hygienic foot measures and therapeutic procedures is more easily obtained.

(2) The routine use of potassium permanganate soaks is of practical therapeutic value in the treatment of ringworm infections, especially minimal infections, which would otherwise remain untreated.

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Food Handler's Infection (Swine Erysipelas) in Man

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SUMMARY

Swine erysipelas in man can at times be a serious and even fatal disease.

The usual cutaneous type runs a prolonged course when treated by any of the older methods.

Experimental and clinical evidence indicates that penicillin aids greatly in the treatment of the disease.

ERYSIPELOID of Rosenback (swine erysipelas) in man, long a common disease in Europe, is now being encountered more frequently in this country.[11] Cases of it are seen fairly often by industrial physicians who care for employees of large food processing plants and occasionally by physicians in private practice among patients working in a variety of industries.

As the disease may be serious or even fatal, although usually a fairly benign self-limited skin lesion, recognition and understanding of the infection is important.

Most of the literature on the subject is in periodicals which the industrial physician is not likely to encounter casually, such as journals of bacteriology, animal husbandry and dermatology.

The disease occurs most frequently in meat processors and in handlers of fish,[5] especially shellfish. Often the organism enters through a puncture wound such as may be caused by the bite of a lobster or the prick of a bone spicule, or through an existing skin abrasion.

There have been large series of cases reported in other occupational groups, such as fertilizer manufacturers and button workers.[8] In this latter group, many of those who had had contacts with the bone dust had severe bronchitis, the organism having entered through the bronchial mucous membrane. In these cases presence of the organism was not proved bacteriologically.

Although the organism is found on much of the food eaten by humans, only one case is reported in which entry was by way of the gastro-intestinal tract.[2] The patient supposedly got the disease from eating salt pork. Direct transmission from pigs to man is uncommon. Although there is no disease of fish known to be caused by Erysipelothrix rhusiopathia, the slime on the body of the fish seems to attract large numbers of the organisms.

It is now accepted that the erysipeloid of Rosenback and swine erysipelas in man are one and the same, and that the disease is caused by Erysipelothrix rhusiopathia.[10] This organism is a non-motile Gram-positive, microaerophilic rod which is found widespread on decomposing nitrogenous matter. It is usually saprophytic, but may easily become pathogenic. There are three strains of Erysipelothrix rhusiopathia: human, swine and mouse. The mouse strain is important mainly because it affords material for experimental evaluation of therapeutic agents.

In the infection in swine, there are three distinct clinical types of the disease which are quite common to man, and it is from these that most of the present knowledge has been gained. Cases of each of the three types have been reported in man. They are:

1. Acute fulminating septicemia, which in the past has been fatal to pigs in 80 per cent of cases. Two proven cases of septicemia in man, both fatal, have been carefully studied and completely reported.[6, 9] It is interesting that in the case reported by Klauder, the original skin lesion was at the site of incision for drainage. There is a distinct possibility that the organism thus entered the blood stream.
2. The subacute cardiac or polyarthritic type. This probably is an aftermath in patients who have survived the acute blood stream infection. The clinical course and findings are much like those of rheumatic fever in man, with valvular vegetations and joint changes.
3. The cutaneous type of "diamond skin disease" is the mildest and most common in both swine and man.

THE INFECTION IN MAN

The skin lesion in man is very similar in appearance to that of erysipelas, with an advancing, violescent, slightly elevated border and lighter center. It is distinguished by the fact that the center fades without desquamation. There are localized itching and burning but only occasional general symptoms and never suppuration except from secondary infection. The lesion is rarely seen above the wrists. There may be arthritic manifestations in the joints in the involved hand. If the patient is a food handler—90 per cent of them are—that helps to confirm the diagnosis. On blood smear the monocytes are usually found to be increased. Diagnosis can be made by culturing the organism from biopsy specimen from the skin, but in view of the serious consequences of bloodstream infection, this should not be undertaken lightly.

The cutaneous form of the disease is usually self-limited, lasting ten to 20 days, but it may recur over a period of months.

It is because the condition is to a large extent self-limited that evaluation of methods of treatment has been confusing. Statistics based on small series

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are of no value. Larger series reported upon before the use of penicillin[4] show an average duration of seven to 17 days, regardless of the type of treatment. Local measures such as x-ray, carbon dioxide snow, and ointments, as well as antisera and the sulfonamides, have been tried with no significant difference in results.

When the sulfonamides were introduced they were expected to solve the problem. Working experimentally with mice, Klauder[7] concluded that they had only a "limited therapeutic effect." Mortality was 100 per cent in an untreated control group. The mortality rate was 85 per cent in a second group given a course of sulfonamide beginning immediately after inoculation of the organism. In a third group given sulfonamide therapy, both before and after inoculation, the mortality rate was 50 per cent. The results of Heilman and Herrell[3] are spectacular in contrast. Forty infected mice were treated with penicillin and only two (5 per cent) died, whereas all 40 of the untreated mice died. These investigators had previously demonstrated the sensitivity of the organism to penicillin, *in vitro.*

Penicillin is especially effective in the treatment of the more serious (but rare) septicemia with generalized manifestations. In one case reported by Ehrlich[1] the patient had generalized bullae and high fever, probably on an anaphylactic basis. There was rapid response to massive, frequent doses of penicillin, with eventual complete recovery.

Results in three cases reported in succeeding paragraphs indicate that penicillin may help in shortening the course of even the mild cutaneous type. As the patients were treated during a period when penicillin was just coming into general use, the reports indicate the better results obtained with increasing the dosage of the drug as it became more readily available.

CASE REPORTS

CASE 1.—The patient received a puncture wound on the left thumb while cleaning fish in January 1945. A rash appeared at the site and he sought medical advice four days later. Local compresses were used over a two-week period with gradual subsidence of symptoms. A week or so later, however, there was recurrence of the skin rash on the thumb and extending to the dorsum of the hand. Compresses were started immediately and on the third day 50,000 units of penicillin in normal saline were given intramuscularly. This was repeated 48 hours later. The rash faded and the patient was discharged two days later. There has been no recurrence. The whole course of the disease lasted a month.

CASE 2.—The patient was scratched on the dorsum of the right hand by a crab shell in October 1945. He was first seen at the office two days later. A glycerin and alcohol compress was applied to the hand and 100,000 units of penicillin were given daily for four days. The patient was discharged on the fifth day and there has been no recurrence.

CASE 3.—The patient was first seen in the office October 20, 1947. Two days before he had received a puncture wound on the flexor surface of the right little finger from a fish bone. There was tenderness on motion of the finger, causing suspicion of tendon sheath involvement. The patient was sent immediately to the hospital where 100,000 units of penicillin was given as an initial dose, and then 30,000 units every three hours for 36 hours. He insisted on leaving the hospital at the end of 44 hours. There has been no recurrence. At no time did the patient have fever or other general symptoms. At the time of hospitalization, leukocytes numbered 7,800 with a normal differential save for a slightly increased monocyte count.

COMMENT

In none of these cases was any attempt made to culture the organism, but the skin lesion in each was quite characteristic and there could be no doubt as to the clinical diagnosis. All were fish handlers. It should be added that all food handlers who come under the author's care for puncture wounds or abrasions receive a prophylactic injection of tetanus antitoxin. The patient in Case 1 could well have had spontaneous recovery coincidental with the administration of the penicillin. It is difficult to believe that two small doses of penicillin 48 hours apart could have altered the course of the disease to any marked degree.

However, as the patient in Case 2 was seen earlier in the course of the disease and treated more intensively, it is reasonable to believe that penicillin may have played a part in the rapid recovery. By present standards the dosage given was woefully inadequate.

The third patient had large and frequent doses and recovery was rapid and complete.

Discussion by J. MINTON MEHERIN, M.D., *San Francisco*

Swine erysipelas in man, although not uncommonly encountered, is commonly not recognized. With the universal use of penicillin for most types of infection the lack of recognition may not be of such great importance unless the possible seriousness of the infection is entirely overlooked and it is treated by local and ineffective measures. An understanding of the lesion may be of value in prevention of it. Workers exposed to the organism should be instructed to scrub their hands with soap and water whenever they suffer an abrasion, laceration or a puncture wound. The time consumed may be repaid many times.

All of the cases that I have seen have been in handlers of raw shellfish. In most cases the infection started in minor breaks in the skin about the fingernails. Before the advent of penicillin, I was convinced that the progress of the lesion was definitely impeded by the use of the sulfonamides. A colleague treating a similar group of patients thought that the drug had no effect on the condition. A recent case which had been neglected for five days cleared up satisfactorily in 48 hours with two injections of 300,000 units of penicillin in wax. I have never seen a case of septicemia from this organism.

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CASE REPORTS

- Carcinoma of the Rectum Complicating Pregnancy
- Asymptomatic Aneurysmal Dilatation of a Right-sided Aortic Arch
- Thorn in Body Causing Abscess After Twenty-one Years

Carcinoma of the Rectum Complicating Pregnancy

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CARCINOMA of the rectum complicating pregnancy is comparatively uncommon, although it is quite probable that this condition occurs more frequently than the paucity of the reports in the literature would indicate.

Modern texts on obstetrics give little information concerning this particular complication of pregnancy.

In 1947, Bacon and Rowe[2] made a thorough study of this subject in regard to methods of treatment. They were able to collect reports of 70 authentically proven cases and added four of their own. For the management of this complication they suggested the following procedures, with which the author is in accord:

"... (a) in early pregnancy (3 months or less) abdominoperineal proctosigmoidectomy without colostomy and with preservation of the sphincter musculature, or as a second choice, a Miles abdominoperineal extirpation, especially when the lesion is less than 6 cm. from the anal margin, and with relative disregard to the pregnancy; (b) in the second trimester where the fetus is not viable and the size of the uterus would necessarily interfere with the removal of the growth, Porro section and resection simultaneously, if the condition of the patient warrants such a procedure; (c) in the last trimester of pregnancy, cesarean section and hysterectomy followed by removal of the cancerous bowel two to four weeks later. Where the circumstances are ideal and the condition of the patient excellent, radical resection performed at the time of section may be justifiable."

Adair[1] believes that it is best to interrupt the pregnancy as soon as possible after the diagnosis is made if there is any possibility of cure. Stander[3] is of the opinion that the pregnancy should be disregarded in the presence of carcinoma of the rectum, except in the last two months.

The following case of carcinoma of the rectum with almost complete obstruction complicating pregnancy (five months) was observed recently.

CASE REPORT

The patient, a white woman 34 years of age, when first observed on February 27, 1948, complained of bleeding from the rectum over a period of two years. Definite changes in the frequency and character of stools had been noted periodically for about the same length of time. For the past ten months the diarrhea and bleeding had increased in amount and severity, and this had been accompanied by a loss of ten pounds in weight, anorexia, and generalized fatigue. The patient had an 11-month-old baby and was about five months pregnant on admission. She had three other children, living and well (ages 7, 5, and 3). The past history included no operations or serious illnesses. Family history disclosed no record of cancer.

The patient was thin, anemic, and moderately dehydrated. The size of the uterus indicated a pregnancy of about five months; otherwise, the abdominal examination was not remarkable. Digital examination disclosed a hard, annular, constricting tumefaction, five centimeters from the anorectal junction, invading the perirectal fat and fixed by malignant extension. Proctosigmoidoscopy revealed a typical ulcerating carcinomatous lesion with deep infiltration which narrowed the lumen sufficiently to preclude advancement of the instrument. A biopsy specimen taken from the lesion was reported "adenocarcinoma, grade II." An interesting point to consider here is that the patient had had a normal pregnancy and delivery without an investigation of the terminal intestinal tract during either the prenatal or postpartal periods notwithstanding the presence of the characteristic symptoms of carcinoma of the rectum, which had existed for two years. Considering the magnitude of the lesion, there can be little doubt that it had been present for at least a year, because this type of tumefaction usually requires about 12 months to encircle the lumen of the bowel. From this it can be concluded that the tumor was undoubtedly present during the previous pregnancy.

Laboratory findings were as follows: Hemoglobin, 7.9 gm. per 100 cc. (a value of 55 per cent); erythrocytes, 3,060,000; leukocytes, 8,500; packed red cells made up 32 per cent of the whole blood; serum albumin, 2.47 gm. and serum globulin 2.16 gm. Results of urinalysis were within normal limits. A roentgenogram of the chest was negative for lung metastases.

The lesion was considered, technically, as inoperable (Group II) due to the invasiveness and fixation of the tumor. The patient was admitted to the hospital and was immediately started on a course of x-ray therapy in the hope that the tumor would be radiosensitive and that what was thought clinically to be a nonresectable lesion could be made amenable to surgical removal. A further aim was to terminate gestation.

After receiving an intensive course of external radiation (4,000 r), the patient was examined again on March 23, 1948. Rectal examination at this time disclosed very little regression in the tumor. The fixation by malignant extension was such that it ruled out resection. The lesion was still annular, showing marked constriction, causing a high degree of obstruction, and colostomy (sigmoid) was recommended as soon as the patient was able to undergo operation.

As a result of radiation there had been no fetal heart tones or movements for a period of ten days and the gynecological consultant advised therapeutic emptying of the uterus by means of a transabdominal hysterectomy at the time of colostomy, because the size of the pelvic mass made it impossible to deliver vaginally even a small fetus.

On March 30, 1948, Porro-cesarean section and loop colostomy (sigmoid) were performed. Findings at operation confirmed preoperative observations in that the lesion was fixed, infiltrative and involved the entire lower pelvis, retroperitoneal nodes, iliac nodes and aortic nodes. The abdomen was moderately distended and some jaundice developed during the first postoperative week, but after the colostomy began

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to function, the patient's general condition improved and she was out of bed on the 15th postoperative day. The patient was discharged on the 45th postoperative day.

SUMMARY

A case of carcinoma of the rectum complicating pregnancy is reported and the salient features of the case are presented. This is the 75th case of its kind on record.

1217 Twenty-sixth Street.

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Asymptomatic Aneurysmal Dilatation of a Right-sided Aortic Arch

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THE persistence of the right fourth aortic arch with complete or partial obliteration of the left fourth arch resulting in a right-sided aorta is a fairly uncommon congenital anomaly. Rarer still are the cases in which the descending aorta actually enters the right lung field. The case here presented is one of asymptomatic aneurysmal dilatation of a right-sided aortic arch with a persistent diverticulum of the left aortic arch. It is reported both because of the rarity of the condition and because of the marked dilatation and sclerosis which so well demonstrated the anatomic variation without the use of contrast media.

CASE REPORT

The patient, a 79-year-old white female, entered the San Joaquin General Hospital with a diagnosis of possible right pneumothorax. The patient had been in this hospital several times for such complaints as a mild cerebrovascular accident, and for epistaxis. There never had been any previous radiographic examination. The complaints on this entry were no more than those expected of a patient with mildly decompensated arteriosclerotic heart. On direct specific questioning after the diagnosis had been made, she denied any symptoms that could be ascribed to the existing condition. Physical examination as far as the abnormality was concerned revealed only a slight dullness to the right of the sternum.

The initial single posterior-anterior film (Figure 1) presented for interpretation showed a large homogenous mass occupying about half of the right hemithorax. This mass was convex outwardly, sharply demarcated, extending from the region of the arch of the aorta out into the lung field to within 2.5 centimeters of the right lateral chest wall, and then curved downward and medially crossing the diaphragm in the region of the right cardiophrenic angle. On the medial aspect of the mass was an area of radiolucency which separated this border from the right cardiac contour. The superior medial border of this mass could be followed to the left across the midline where it was continuous with a shadow of vascular density which was slightly higher than the usual location of the aortic knob. This shadow to the left of the midline did not have the expected shape of an aortic knob and its outer left border was continuous upward with the left side of the superior vascular shadow. There was no descending aorta shadow on the left. The trachea deviated slightly to the left in the superior mediastinal area. At this time it was felt that the most likely diagnosis was aneurysm of a right-sided aorta, and to corroborate this impression fluoroscopic examination and esophageal visualization with barium were carried out.

Fluoroscopic examination showed pulsation of the vascular shadow in the region of the knob and also of the large mass in the right hemithorax. These pulsations were expansile in character and followed in rapid sequence the apex beat. The remainder of the findings can be described and demonstrated in the views taken with barium outlining the esophagus. As seen in the posterior-anterior film (Figure 1) there is a 2.5 centimeter displacement of the esophagus to the left of the midline in the region of the aortic knob,

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From the San Joaquin General Hospital.

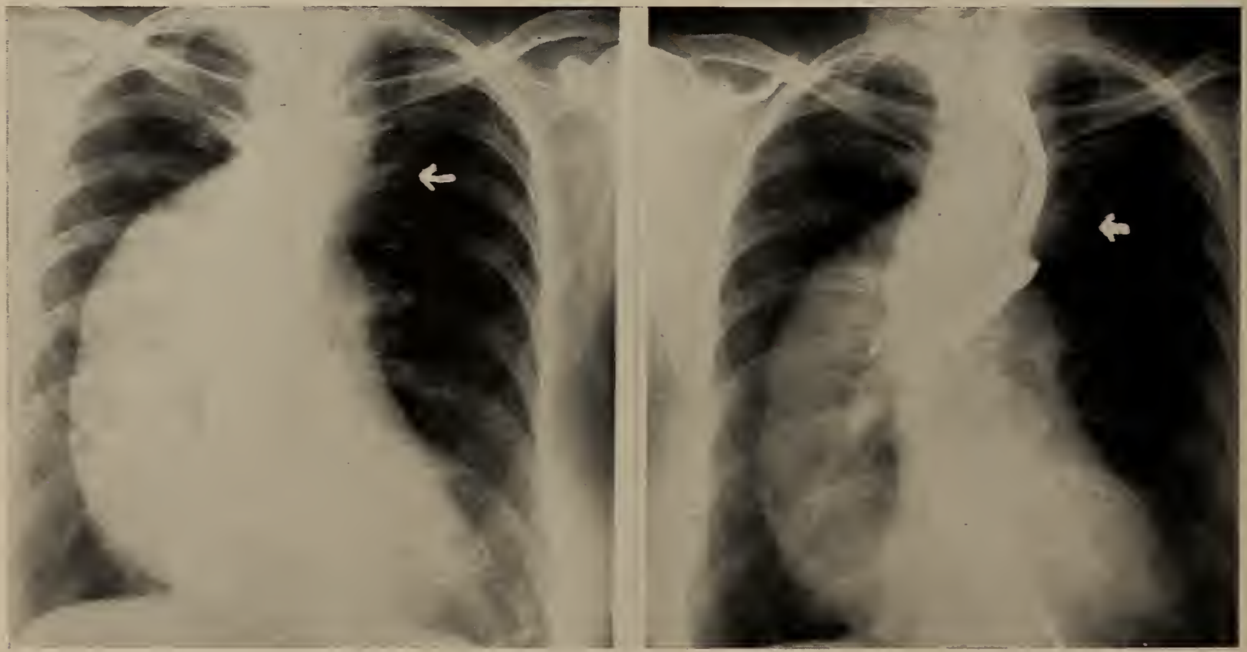

Figure 1.—*Left*—Posterior-anterior view. The right sided position of the descending aorta is demonstrated. Arrow points to aortic knob. *Right*—Posterior-anterior with barium-filled esophagus. The displacements of the esophagus by the aorta are seen. Arrow points to aortic knob extending to left of esophagus.

but part of the vascular shadow falls to the left of the displaced esophagus. This region of esophageal curve is made up of two fairly hemispherical arcs. The upper arc measures about 4.5 centimeters and the lower about 2.5 centimeters. The esophagus then swings to the right and is in close approximation to the left side of the aorta in its abnormal course through the right lung field. It then crosses the midline at the elevation of the 11th thoracic vertebra and enters the abdominal cavity in the normal position to the left of the midline. There were several sections of the esophagus which showed some delay in the passage of the barium, but these delays were easily overcome by the administration of another small amount. The aorta was 6 centimeters wide in the region of the arch and 7 centimeters in width throughout its descending course.

In the right anterior oblique projection (Figure 2, *left*) the expected abnormal cloudiness of the upper part of the mediastinum and the lateral and posterior course of the descending aorta were well visualized. An anterior displacement of the trachea in the upper part of the chest was noted, and separation of the esophagus from the spine in the region of the arch, by a gap 6 centimeters wide, was visualized. The contour of the esophagus in this region was again that of a double arc with a total diameter of 6 centimeters. The barium column followed the inner border of the aorta into the right lung, and the width of the aorta varied between 6 and 7 centimeters throughout the descending course. The pulmonary artery was visualized end on, just inferior to the arc formed by the esophagus.

The left anterior oblique film (Figure 2, *right*) showed the aorta and the cardiac shadow superimposed due to the abnormal course of the aorta. The posterior aspect of the esophagus at the level of the sixth thoracic vertebra had a hemispherical defect with an arc of 2.5 centimeters.

The lateral view (Figure 3) added nothing but showed the marked anterior displacement of the barium-filled esophagus with the doubled curved defect.

COMMENT

The embryology of the development of the aortic arches into the final adult structure and the multiplicity of abnormalities which can result from any disturbance during the period of growth have been completely described in other papers. In this presentation the changes which result in the abnormality reported will be briefly considered.

In the usual development the left fourth arch persists in its entirety and with the left portion of the ventral and dorsal embryonic aorta forms the adult left sided aorta.

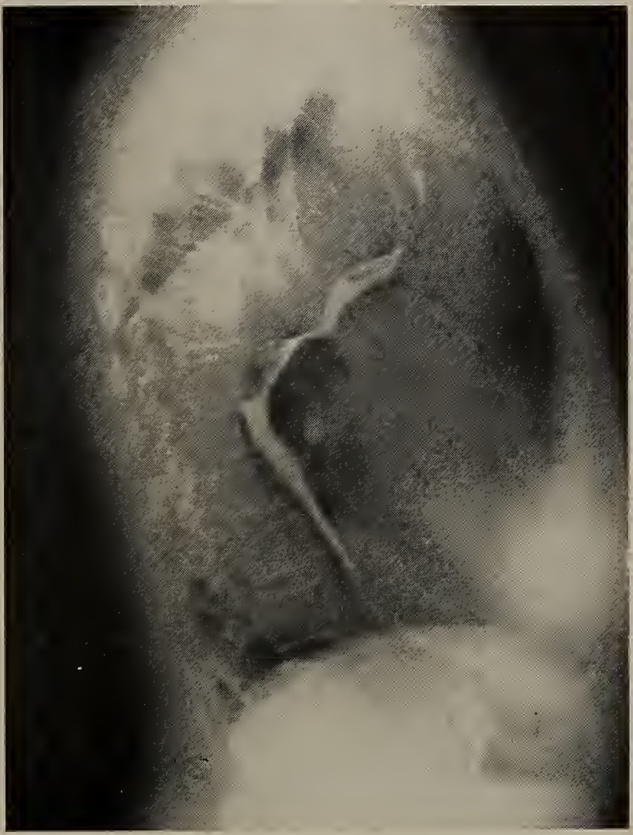

Figure 3.—Lateral view showing anterior displacement of esophagus and trachea.

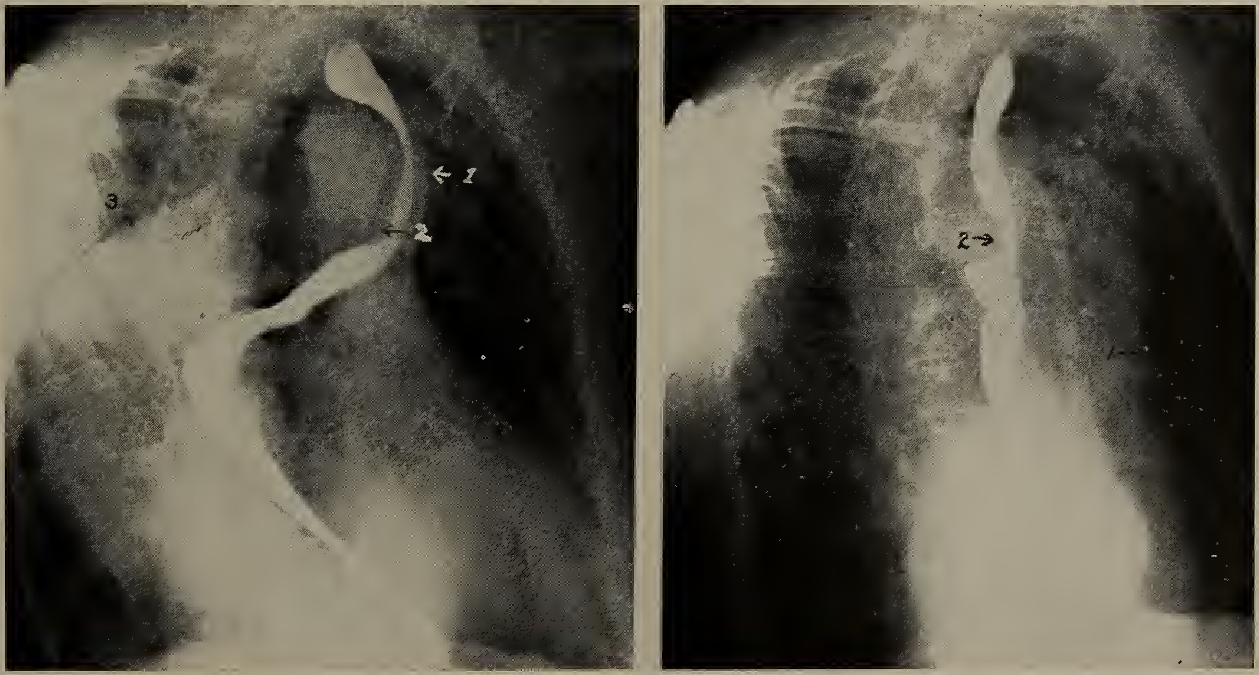

Figure 2.—*Left*—RAO, with barium-filled esophagus. The entire course of the aorta is outlined (usually seen in LAO). Arrow 1, aortic knob. Arrow 2, aortic diverticulum. Arrow 3, descending aorta. *Right*—LAO, demonstrating hairpin bend of aorta (reversal of normal). Arrow 1, descending aorta. Arrow 2, aortic diverticulum.

When in the course of growth there is some interference in the development of the left aortic channel and this upset is early enough so that the right fourth arch has not yet developed into the innominate and subclavian, this right fourth arch will take over the function of the left fourth arch and, with the right portion of the ventral and dorsal embryonic aorta, will form the adult aorta.

Interference with development of the left arch may take place anywhere along its course. and if the interference is such that the aortic root persists, with disappearance of the dorsal part of the embryonic arch to the origin of the ductus arteriosus, the result is a posterior diverticulum from which the left subclavian arises.

With the essential embryological changes in mind, the unusual roentgenographic findings noted in the case reported are more clearly understandable. The elevation of the aortic arch noted in the posterior-anterior view was due to the fact that the right main bronchus lay higher than the left. The right ascending aorta hooked up over the right bronchus before swinging to the left and therefore had to ascend higher than does a normal left aorta.

The absence of a descending vascular shadow on the left of the spine in the frontal projection and the clearance of the spine in the left oblique were both explainable on the basis of the descending aorta's course to the right.

The displacements of the barium-filled esophagus in the region of the aortic arch were due to the right and posterior position of the aorta. From a study of the type of arcs and measurements of the radii of them, the authors have concluded that the main anterior displacement was due to the arch and the dilated first part of the descending aorta and the displacement to the left was due to the descending aorta. In both of these displacements the impression of the diverticulum was visible on the filled esophagus.

The presence of the descending aorta in the right lung field was no more than would be expected in marked dilatation and elongation of an aorta falling to the right of the spine.

The aortic knob is usually absent in a right-sided aorta, and, when present, is probably due to a prominent diverticulum or an enlarged left subclavian artery. Upon studying the knob present in the case reported, it was noted that it was large and measurements led to the conclusion that it was a portion of the aortic arch which had been displaced to the left by the elongation and dilatation of the aorta.

SUMMARY

An unusual case of aneurysmal dilatation of a right-sided aorta and a brief review of its embryological aspects have been presented. In spite of the pronounced dilatation no definite symptoms were produced.

425 North California.

Thorn in Body Causing Abscess After Twenty-one Years

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THE following case is reported because of the unusually long harboring and the ultimate spontaneous expulsion of a foreign body.

A 34-year-old veteran was first seen by the authors in August, 1947, at which time he was given pneumoperitoneum for pulmonary tuberculosis. While overseas in the army he had been hospitalized in Hawaii with the diagnosis of pulmonary tuberculosis and had been further hospitalized in San Fernando.

On January 14, 1948, he first complained of a swelling in an old scarred area on the medial aspect of the right leg about eight inches below the patella. Examination revealed a fluctuant, slightly tender mass about the size of an almond. Under 1 per cent procaine anesthesia an incision was made over this mass and approximately 4 cc. of seropurulent fluid escaped. A dry dressing was applied and the patient was instructed to apply hot compresses at home. Forty-eight hours later when the dressing was removed the pointed end of a foreign body was observed protruding from the incision. Removed, it was found to be a thorn three-quarters of an inch in length. Following removal of the foreign body all drainage ceased and the incision healed in a few days.

At this time the patient recalled the following facts: At the age of thirteen, 21 years previously, on a Halloween night he had fallen into a hawthorn bush, spraining the left knee and running a thorn into the knee above the patella. He had much difficulty in walking. At the time part of the thorn was pulled out but the remainder could not be withdrawn. The next morning he went to a physician who poulticed the knee with flax, and this treatment was continued daily for four months. The leg continued to swell. Movement was very painful and it was springtime before the patient was ambulatory. At one time an abscess apparently pointed just lateral to the patella, but this was never incised and it regressed spontaneously after heat from grass lanterns had been applied, and the leg improved thereafter. In 1941, 15 years later, the patient joined the Army and went through several campaigns. In October, 1941, an abscess the size of a small egg pointed about eight inches below the patella on the medial aspect of the tibia. This was lanced and drained for about one week and then healed spontaneously. The patient returned to duty and went through the Aleutian campaign and then to the South Pacific with no symptoms. In 1944 he was hospitalized for tuberculosis. There were no symptoms referable to the leg until January, 1948. The thorn had been in the body for 21 years and three months and had migrated in the leg for a distance of almost 12 inches.

SUMMARY

A foreign body apparently present for 21 years was the causative factor of a chronic, recurring abscess.

490 Post Street.

MEDICAL PROGRESS:

Recent Advances in Cardiovascular Surgery

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VASCULAR surgery has a rich heritage in America, having been founded on the fundamental observations of Carrel, Guthrie, Halsted, Matas, and others many years ago. Although progress has been steady, it is not surprising that great strides in the past decade were made possible by the improvements in anesthesia, a better understanding of the physiology of thoracic surgery, and technical improvements in the management of suture anastomosis of great vessels. As one looks at the broad field of cardiovascular surgery, one striking fact is apparent: none of the advances could have been achieved without animal experimentation.

Much has been accomplished through the development of the anticoagulants heparin and dicoumarol, the extension of sympathetic nervous system surgery, and in the management of aneurysms and arteriovenous fistulas, but space does not permit a review of these subjects. For reasons of brevity, attention will be directed toward recent progress in operations for portal hypertension and on the heart and adjacent great vessels.

Portacaval Shunts for Portal Hypertension

It has long been known that severe gastrointestinal hemorrhage can result from esophageal varices caused by chronic obstruction in the portal circulation. Whipple's report in 1945 renewed interest in the possibility of surgical treatment of this condition.[57] The problem was taken up by Blakemore[5, 6] and, subsequently, by Linton.[41] Four types of venous shunts are now being used to relieve the portal hypertension resulting from intrahepatic and extrahepatic obstructions: splenectomy, nephrectomy, and end-to-end anastomosis between the splenic vein and renal vein; anastomosis between the distal end of the portal vein, after its division, and the inferior vena cava; and side-to-side anastomosis between the portal vein and inferior vena cava. Of these procedures the end-to-end anastomosis between the renal and splenic veins is the least desirable because it requires nephrectomy; the side-to-side portal vein-inferior vena cava shunt would appear to be the most satisfactory. Linton recently has reported several apparently successful anastomoses between tributaries of the portal vein and the inferior vena cava.[41]

It seems clear that splenectomy alone for extrahepatic block (Banti's syndrome) will relieve only those patients in whom the site of obstruction is distal to the junction of the coronary vein. In this group the immediate results of portacaval shunts have been quite encouraging, particularly in those patients who have good hepatic function.

Blakemore has this to say in regard to patients with portal hypertension due to cirrhosis: ". . . we consider the procedure no longer an experimental operation but commend its consideration in cases of cirrhosis when patients have had one or more episodes of gastrointestinal hemorrhage—patients who when treated medically under the best of circumstances have only a 50 per cent chance of living."[7] In the presence of ascites, when vigorous medical treatment has resulted in improvement, and roentgenograms have demonstrated the presence of esophageal varices, Blakemore recommends a portacaval shunt, and states that such patients are among the most grateful for the relief obtained by the operation. He has reported a series of 58 cases in which various types of shunt were performed between the portal circulation and inferior vena cava. There were 11 postoperative deaths. The majority of the survivors were benefited by the operation.

Wounds of the Heart

During the past two decades a great many valuable observations have been made on contused and penetrating wounds of the heart, with a gain in knowledge and experience of great value in the management of patients with such injuries. It is now known that moderate blows and compression injuries to the heart are fairly well tolerated when treated on a regimen similar to that used for coronary occlusion. It has also been shown that many small puncture wounds, such as those produced by ice picks and hat pins, require no operative treatment, or at most aspiration of the pericardial sac. In fact, aspiration is recommended by a number of observers, notably Streider,[53] Singleton,[52] and Blalock and Ravitch,[10] whenever there is evidence of slow filling of the pericardial sac following a wound of the heart. On the other hand, when there is evidence of rapid filling of the pericardial sac (elevated venous pressure, low arterial pressure, diminished cardiac pulsation, and a quiet heart)[1, 13] a relatively large laceration of the heart or coronary vessels should be suspected and early operation is indicated to evacuate the clot and suture the laceration.

Although experimental evidence indicates that retained foreign bodies in or near the heart may cause few cardiac disturbances,[22] there is a growing belief that they usually should be removed. This attitude was further supported by Harken and his associates, who during World War II achieved the amazing record of removing 134 missiles from the region of the heart and great vessels without an

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operative death.[34] In this group there were 13 cases in which foreign bodies were recovered from various chambers of the heart.

Constrictive Pericarditis (Scar Compression of the Heart)

Although this disease was recognized in the seventeenth century, it is usually called Pick's disease because of the excellent description of it by Pick in 1896.[46] There are a number of etiologic agents, but tuberculosis is the most important and frequent cause. It is generally considered that rheumatic fever is not a common cause of the constrictive type of pericarditis.

Characteristically, the dense adherent scar limits diastolic filling of the heart, reduces cardiac output, and thereby causes the profound disturbances which occur in the circulatory physiology. Scar tissue involvement of the superior and inferior venae cavae also prevents the normal flow of blood into the heart, and, as a consequence, venous pressures as high as 400 mm. of water have been recorded. Distention of the neck veins becomes evident. Venous congestion eventually causes enlargement of the liver, ascites, occasional pleural effusion, and edema of the lower extremities. It is quite understandable that this disease is often mistaken for cirrhosis of the liver.

The heart is usually small, but may appear to be normal or enlarged because of the thickness of the pericardium. There is a lack of pulsation which can be demonstrated in kymograms and by fluoroscopic examination. The heart sounds are quiet, and there is usually a paradoxical pulse.

Surgical relief for this condition was first accomplished by German and French surgeons; in this country Churchill is given credit for being the first to perform a successful pericardiectomy.[14] Since then numerous surgeons have reported their experiences,[1, 9, 36, 38] and there has been a steady decrease in operative mortality. It has been stated erroneously that it is necessary only to remove a window over the anterior portion of the heart for relief of the constriction. Beck[1] and Holman[38] have shown that the best results follow complete removal of the anterior pericardium, combined with excision of the scar from the cavae. To visualize this whole operative area, Holman advocates an approach through a median sternotomy. In competent hands, the great majority of patients subjected to this type of operation are cured or considerably improved.

Defects in Cardiac Septa

Certain interventricular and interauricular septal defects, when not associated with other congenital malformations, are now being contemplated as lesions suitable for operative correction. When small they are frequently asymptomatic and of little significance. Large defects, however, can produce symptoms and may be the cause of cyanosis. Murray,[42] who has closed a number of these openings in patients, has this to say about operative intervention in septal defects: "The cases to be considered for operation in my view are those in which the heart is not excessively enlarged; the septal defect is not too large, such as occurs with a single ventricle, and before the patient has reached maturity. On the other hand they may not be suitable for operation when there is evidence of an enormously enlarged heart with failure and perhaps a single ventricle instead of a medium-sized defect in the septum."

The interventricular defects were closed by passing a strip of fascia lata anteroposteriorly through the heart at the level of the opening, forming a bridge across the defect. The interauricular defect was closed by approximating the margins of the opening with sutures passed through both walls of the auricle. Five patients were operated upon, with one postoperative death. These procedures must still be considered in the investigative phase, but they demonstrate that the heart will tolerate this type of operation, and eventually these or similar methods may be used by cardiac surgeons.

Intracardiac Surgery

A renewed interest has developed in intracardiac surgery during the past few years. Cutler in 1925 demonstrated that a stenotic mitral valve could be resected blindly,[17] but the results were so disappointing that the work was dropped.[18] This approach to the treatment of valvular stenosis can be criticized on the basis that substitution of valvular incompetency for stenosis may only replace one type of poorly tolerated defect with another.

A totally new approach is offered by Gross and his associates, who have been constructing experimental extracardiac shunts with homologous blood vessel and valve grafts, although only partial success has followed this procedure in experimental animals.[32]

Harken recently tried to alleviate the pulmonary hypertension of mitral stenosis by creating an interatrial septal defect in two patients. In two other patients "mitral valvuloplasty" was performed, with one death. To quote from Harken: "These cases are now reported only to indicate the ability of such patients to withstand operations. The evaluation of any long-term benefits attributable to these procedures—and, indeed, of the ultimate position of mitral stenosis — must rest on objective criteria gained from hemodynamic studies carried out before and after operation. Subjective selection of patients and assessment of results lead to dangerous competitive exercises in surgical techniques rather than to fundamental advances in therapy."[35]

Myocardial Ischemia

In spite of a great deal of painstaking experimental work and much clinical investigation, surgeons are still unable to be of much assistance in the relief of coronary artery disease. Two avenues of attack have been pursued: methods of relieving pain and vasospasm in angina pectoris, and the development of an extracardiac collateral blood supply.

Franck[21] (1899) is given the credit for being the first to suggest sympathectomy for angina pectoris; but this suggestion was not tried clinically until 1916 by Jonnesco[40] who performed a bilateral cervical sympathectomy, including the removal of the stellate ganglion. Good and bad results have followed various modifications of this original operation. At present, Goetz[24] believes in resection of the upper four or five posterior roots, while White and Smithwick recommend resection of the upper three thoracic sympathetic ganglia.[58] In patients who are satisfactory operative risks the relief from pain obtained by these operations is beneficial; other non-painful sensations evidently take over the function of warning the patient that he is straining his heart.

Although the omental and pectoral muscle grafts to the heart, suggested and tried by Beck[20] and O'Shaughnessy[44, 45] appeared to offer some hope in the treatment of myocardial ischemia, clinical trial has not been on a broad enough scale to evaluate the methods. More recently, Beck[2, 3] showed experimentally that a blood vessel graft could be used to carry arterial blood from the aorta to the coronary sinus, and thus prevent death from ligation of the coronary artery. At the moment this operation is not ready for clinical application. It evidently demonstrates that, in the heart at least, blood can be made to reverse its direction of flow through the capillary bed and be effective. Also still in the experimental stage is Murray's[43] work on myocardial infarcts, in which he showed a better survival rate in the group of animals which had resection of the infarcted cardiac muscle than in those which had no resection.

Patent Ductus Arteriosus

Approximately seven out of ten patients with an open ductus arteriosus will not survive to the age of 40. In 30 per cent death is due to cardiac failure and, according to Shapiro and Keys,[51] 40 per cent die of acute bacterial endarteritis. A few deaths occur from rupture of the ductus or the pulmonary artery.

Surgical closure of the ductus has been accomplished by many surgeons since the first successful ligation in 1938 by Gross and Hubbard,[29] and it may now be stated that in competent hands the operative mortality rate is less than 5 per cent. While ligation in continuity with two or more ligatures is commonly employed, it would appear that this method is followed by a 20 per cent incidence of recanalization. Owing to this, Gross now divides the ductus between clamps and sutures the cut ends.[25, 26] There is no question that division is the best surgical procedure, but it is often difficult to obtain enough length in the ductus of an adult to use the method safely. Jones recently reported his experiences with ligation and division and showed that even though ligation is the simpler procedure it can be followed by serious complications.[39] Touroff[55, 56] prefers ligation to division when there is evidence of endarteritis; in such circumstances the tissues are often friable and are more difficult to suture than to ligate. Surgical closure of the ductus is best done during childhood before endarteritis and cardiac failure have occurred.

Congenital Aortic Anomalies

Current interest in the surgical treatment of coarctation of the aorta is responsible for its being recognized more frequently than it was in the past. It occurs at least four times more often in males than in females.[33] The aorta is usually constricted just beyond the left subclavian artery, producing hypertension in the upper body and hypotension in the lower extremities. The femoral pulses are weak or absent. Due to the enlargement and vigorous pulsation of the intercostal vessels the lower borders of the ribs may become scalloped.[50] A high degree of hypertrophy of the left ventricle may develop from the increased effort required to propel the blood through the collateral bed. Hamilton and Abbott state that 75 per cent of patients with coarctation of the aorta die of cardiac failure before the age of 40.[33]

The first successful operations were done by Crafoord and Nylin[16] in 1944 and Gross and Hufnagel[30] in 1945. In both instances the stenosed area of the aorta was resected and end-to-end suture accomplished. Since then a number of surgeons have reported their experiences, with an average mortality rate of about 15 per cent.[4, 15, 27] Gross recently reported that in a number of instances he had used a homologous blood vessel graft to bridge a defect in the thoracic aorta after resection of a coarctation.[31] Although the early report is favorable, the eventual fate of homologous grafts is yet to be determined.

The aortic arch may be the site of other congenital malformations which cause pressure on the trachea and esophagus. Two general types are recognized: (1) The double aortic arch, in which a posterior limb passes behind the trachea and esophagus, then joins the anterior limb to form the descending aorta, and (2) right aortic arch with a patent ductus, ligamentum arteriosum or anomalous vessel encircling and compressing the trachea and esophagus. Dysphagia, laryngeal stridor, and attacks of dyspnea are the common symptoms. Gross[28] and Potts, Gibson and Rothwell[48] have reported successful surgical correction of these anomalies, usually by ligation and division of the smaller of the two vessels encircling the trachea and esophagus.

Congenital Cyanotic Heart Disease

One of the most important advances in cardiovascular surgery has been in the treatment of congenital, cyanotic heart disease. This spectacular contribution culminated an extensive clinical and laboratory experience, and it is a great tribute to the value of experimental surgery.

Cyanosis occurs when there is enough reduced hemoglobin in the circulating blood to cause a bluish color to the skin. It is possible for this condition to exist when there is free mixing of venous with arterial blood in the heart due to a large interventricular septal defect. It is more likely to occur when the aorta overrides, or is to the right of a septal defect. When these two anomalies are associated with a narrowed or obliterated pulmonic valve, cyanosis is even more marked, for there is then a reduction in volume-flow of blood to the lungs. Such is the case in the tetralogy of Fallot. Because of the increased effort required of the right heart to work against the stenosed pulmonary artery and the systemic pressure in the overriding aorta, hypertrophy of the right ventricle develops. The heart then assumes a boot-shaped appearance in roentgenograms, and the electrocardiogram shows a right axis deviation.

The degree of invalidism varies widely in this group of patients. Some are able to walk or even run a little, but many of them have marked limitation of activity, spending most of their waking hours in a characteristically squatting position. There is pronounced polycythemia and a high percentage of packed red cells, which predisposes toward thrombosis. Not infrequently this occurs in cerebral vessels, causing complex neurological changes.

It has been known in patients with tetralogy of Fallot, who had an open ductus arteriosus, that cyanosis or death occurred when the ductus closed. This observation led to the suggestion by Taussig that a ductus might be created surgically to by-pass the narrowed or obliterated pulmonary conus, and thus increase the volume-flow of blood to the lungs. This shrewd suggestion, when wedded to technical skill, gave birth to the "blue baby operation."[11]

The creation of the artificial ductus arteriosus may be accomplished in a number of different ways. Originally, Blalock anastomosed the left subclavian artery to the pulmonary artery, but he subsequently preferred to utilize the right subclavian. Use of the innominate or carotid arteries carries a high incidence of cerebral complications, with an attendant increase in mortality. Blalock and his associates have operated upon more than six hundred of these patients.[8, 54] More recently Potts, Smith and Gibson[49] of Chicago devised an ingenious clamp which permits a direct anastomosis of the aorta to the pulmonary artery. Extensive experience with this method has demonstrated its practicability.[47] The experience at Stanford University Hospital with this technique has been very gratifying[37] and has suggested its use in the younger age group in which the cyanosis is so severe that the patients might not be expected to survive to a more ideal operative age. The over-all mortality rate with these operations is between 5 and 18 per cent.

Reminiscent of Doyen's[19] unsuccessful operation of pulmonary valvulotomy in 1913 is the recent report by Brock[12] of Guy's Hospital in London. He performed valvulotomy in three patients with congenital pulmonic stenosis. The valvulotome was introduced through the right ventricle and the stenosed area was cut while the instrument was guided by palpation. All three patients recovered from the procedure but in one there were emboli to both legs, and in another hemiplegia followed cerebral emboli. In the third patient, a girl of 11 years of age, the result was excellent.

An artificial ductus arteriosus is similar to an arteriovenous fistula between two great vessels, and, of course, to the congenitally persistent ductus arteriosus. Therefore the same physiological disturbances might be expected to follow its creation as occur in the presence of patent ductus or fistula. Yet it is not clear whether adding such a fistula to a heart already burdened by congenital defects and poor oxygen supply actually does increase or decrease the total burden to the heart. Certainly the increased oxygen saturation and lower ratio of packed red cells which follow an augmented flow of blood to the lungs are beneficial to the myocardium. Taussig states that about 30 per cent of such patients show cardiac enlargement during the first three weeks after operation, and a further 30 per cent have shown enlargement six months later.[54] An artificial ductus which is too large will invite cardiac decompensation.[23]

Regardless of the eventual outcome in these patients, their improved physical capacity more than justifies the operative risk and the potential difficulties of the future. Furthermore, experience is being gained, and other advances in cardiac and physiologic surgery can be expected through lessons learned with these patients.

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California Cancer Commission Studies*
Chapter XXXIII

Adenocarcinoma of the Corpus Uteri

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CANCER of the body of the uterus is less common than cancer of the cervix. In large clinics it is observed about one-eighth as often as the cervical variety, although in private practice the latter is observed about as frequently as the former.

Fundal cancer occurs somewhat later in life than does cancer of the cervix, the majority after the menopause. (However, the author recently observed fundal cancer in a patient 28 years of age who had been treated for the preceding six months with various "shots" to control abnormal bleeding.)

GROSS PATHOLOGY

Adenocarcinoma of the endometrium may be diffusely spread over the surface or sharply circumscribed. It may not penetrate the uterine wall until late in its course, or this may occur early. It may first appear as a polypoid growth. In cases in which there is widespread involvement of the wall, the size of the uterus is greatly increased, the tissues are boggy, and the prognosis is grave.

The malignancy of cancer of this type is indicated by the type and arrangement of cells found on microscopic examination, and by the rate of growth of the tumor. Microscopically there are four grades, ranging from a type with only a small percentage of undifferentiated cells to one in which the cells are almost completely anaplastic and all glandular arrangement lost. This method of grading is not so satisfactory in fundal as in other types of cancer, for often all four grades are found in different areas of the same growth.

SYMPTOMS

Most of the cases of carcinoma of the corpus occur in women after the menopause. The commonest and most important symptom is abnormal bleeding. In these days when "shots" and oral estrogens are given for everything from osteoporosis to nosebleed, irregular bleeding can be traced to this cause in many instances. Due to the sheltered position of the tumor it is not subject to trauma, and abnormal discharge or bleeding may be a late symptom.

Pain is usually a late symptom. When it occurs early it is usually the result of some complication, such as infection. In the late stages it is a sign of extension of the growth, either direct or metastatic.

DIAGNOSIS

Any patient who complains of abnormal bleeding should be carefully examined. The cervix should be inspected through a speculum to eliminate it as a possible focal point. The only sure way to make a diagnosis of fundal cancer is by microscopic examination of the tissue obtained by curettement, which should always be done with the patient under anesthesia. Use of the suction curette is advised, as it is possible to explore the entire uterine cavity with this instrument. The old-fashioned curette cannot clear out the upper sixth of the cavity where fundal carcinoma frequently originates. As frozen sections are too thick for accurate diagnosis, embedded paraffin sections should be used.

Submucous myoma may interfere with the curette, making it impossible to reach the malignant area. The author encountered this difficulty recently. After negative findings in an examination of the material obtained by curettage, bleeding was attributed to an obvious fibroid. When the bleeding continued panhysterectomy was done, and an endometrial cancer was found which had extended directly through the uterine wall to the broad ligament. There was a 0.5 cm. area of carcinoma on the endometrial surface at the base of a small submucous myoma.

In the majority of cases of abnormal bleeding no malignancy is found, but it would be better to do many negative curettements than to neglect one early cancer. It should be impressed on the patient that the procedure is necessary not only to rule out malignancy but to establish a diagnosis. In premenopausal patients it may give information as to what type of endocrine treatment is needed. In many cases curettage stops the abnormal bleeding permanently.

Diagnosis by vaginal smear is of great value, but unfortunately there are very few cytologists adequately trained in this work. Cancer has been found by this method in cases in which results of examination of curetted material were negative. Until more people are trained to read the smears it cannot be widely used.

TREATMENT

In suitable cases, the most satisfactory treatment for adenocarcinoma of the fundus is panhysterectomy, with removal of both tubes and ovaries and a liberal vaginal cuff. As preliminary radiation undoubtedly prevents tumor dissemination at the time of operation, most surgeons prefer to use 3,500 to

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*Organized by the Editorial Committee of the California Cancer Commission.

4,500 milligram hours of radium about six to eight weeks before operating. Radiation alone is inadequate, as it does not destroy the cancer in 50 per cent of the cases. It is of value in cases in which operation cannot be done due to obesity, old age, severe heart disease or other physical disability. The objection to the use of preliminary radiation is the delay of two or three months, and in clearly operable cases many surgeons rely on panhysterectomy alone.

At the time of operation the following precautions should be taken:

The lips of the cervix should be sutured together firmly. The vaginal vault should be thoroughly swabbed with Zepharin (or similar antiseptic) and packed with a roll of 3-inch gauze. This elevates the pelvic floor and facilitates operation at the deepest point of the field.

Clamps should be placed on each side of the uterus from the round to the utero-ovarian ligaments in order to obviate the squeezing of malignant tissue out through tubes or lymphatic glands when the uterus is handled.

PROGNOSIS

The prognosis is better for patients with carcinoma of the endometrium than for those with carcinoma of the cervix. The possibility of cure depends on the rate of growth and the degree of malignancy of the tumor, and on early diagnosis and adequate treatment. Periodic vaginal examinations are of little value in discovery of this disease, as the lesion cannot be seen or felt. A history of abnormal bleeding must be investigated immediately.

SUMMARY

Adenocarcinoma of the body of the uterus usually occurs somewhat later in life than cancer of the cervix.

Intermenstrual bleeding or postmenopausal spotting demand immediate, adequate diagnostic curettage.

The best treatment for cancer of the fundus is radiotherapy, followed in six or eight weeks by panhysterectomy.

The prognosis is good when the diagnosis is made early and the disease properly treated.

1136 West Sixth Street.

"Bone Tumors" by Don King, M.D., Chapter XXX of the Cancer Commission Studies, which was scheduled for publication in this issue of California Medicine, *will be printed in the July issue.*

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EDITORIALS

R.I.P.

Governor Warren has come out again in a blast against the State Legislature for its action in tabling his 1949 version of a compulsory health insurance bill. The governor spoke his mind immediately after a committee of the State Senate had tabled his bill and he minced no words in making his position clear. Such items as the "three-million-dollar medical lobby" came into his statement and made good headlines in the newspapers of the state.

Just to set the record straight, the Senate committee acted entirely within its own prerogatives in tabling the governor's bill. The committee is a working body of the Senate, set up to screen the multitudinous bills which are presented to the Legislature and to advise the entire membership of the Senate on the advisability of considering or junking the various measures introduced. Such committees in both the Assembly and the Senate operate strictly within the rules of organization of their respective houses and their actions are subject to review by their respective parent bodies.

Governor Warren's bill was given a fair and complete hearing by the committee. Proponents and opponents were invited to testify for or against the bill and the committee exercised every courtesy and fairness in allowing witnesses to express the considered opinions of their principals. Following this hearing the committee took the bill under advisement and, after further study, voted to table it.

Even this action leaves the bill still available for consideration by the committee or by the Senate, if the desire to give it further consideration actually exists. The committee itself has the authority to reconsider the bill and the Senate as a whole has the right to vote to bring the measure out of committee for consideration on the Senate floor. In view of these possibilities it is a little surprising to find the governor in a petulant mood.

Further, the governor's reference to a multimillion dollar lobby is so far afield from practicality that it deserves no consideration from any thinking person. He was referring, of course, to the fund for public education sought by the American Medical Association for a nationwide campaign. For the governor's benefit, let it be noted that any money raised by the A.M.A. is intended for a national public education campaign and not one cent of such money has been forwarded to California. The purpose of this fund is to give the American public the true facts about compulsory health insurance and to act as a counterbalance for the vast sums spent by numerous federal and state agencies in propagandizing in favor of state medicine. If the A.M.A. campaign were restricted to California, Governor Warren would have long since heard about it.

We suspect that the governor, who has not been averse to using the power and prestige of his own office for lobbying that is not always subtle, may have overlooked the fact that the State Senate just doesn't want a system of socialized medicine in California. Acting within its own democratic processes, the Senate has rejected the governor's bill, despite the political prominence of its sponsor. We can see no objection to the exercise of legal power and authority, even though the wishes of the corner office are not satisfied.

Governor Warren has now watched four of his compulsory health insurance proposals, and a few indirect attempts in the same direction, go down to defeat at the hands of sincere, thinking members of the State Legislature. It would seem gracious on his part to accept the will of the representatives of the people of California and bestow a blessing at the burial of such proposals.

Annual Session—1949

Completion of the Association's 1949 Annual Session—the seventy-eighth in ninety-three years of organization—marked another milestone in the progress of California medicine and taught two lessons. First, that a topflight scientific program can be developed on the base of our own intrastate medical knowledge plus a careful selection of guest speakers; second, that the Association has grown to such a size that added meeting facilities must be sought.

The Annual Session attracted an unusually large number of sound scientific papers, drew a large number of technical and a smaller number of scientific exhibitors, focused public attention for a few days at least on the progress of medical practice and, all in all, provided a meeting place for friends and colleagues on a personal as well as medical basis.

On the scientific side, numerous complimentary remarks have already been heard as to the high quality of the material presented. The Committee on Scientific Work, after months of planning, brought forth a program which was accorded a splendid recognition by those at the meeting. The very overflowing of meeting rooms attested the quality of the papers. Section officers complained only about the inadequacy of the rooms available to them.

On the business side, the House of Delegates, operating with four reference committees instead of three as heretofore, moved swiftly through its deliberations, held elections and installations and paid homage to physicians who have been members of the Association for fifty years or more. The House of Delegates was the largest the Association ever assembled—recognition of the growth of the organization.

As to meeting quarters, the 1949 session fairly burst at the seams. Even the largest meeting room was barely adequate for the number who attended and the smaller rooms were filled to overflowing and to the point where one section chairman complained that a number of members left the meeting because they became tired of standing in the outside hallway. The session utilized every available public room in a large hotel, plus a neighboring theatre and two large rooms in a nearby auditorium building. Even with this space available, meeting quarters were inadequate.

These overflowing crowds bring to mind the fact that the Association has increased rapidly in size in recent years and that new records in Annual Session attendance are on the way. The registration this year topped 3,600 persons and for next year and the years to come will doubtless go higher. In earlier times there were various hotels available to meet the requirements of a smaller membership and a lesser number of specialty section meetings. Now, with an increased membership and an augmented state population, new horizons appear and must be conquered.

Two possible solutions to this problem come to mind at this time. One, that fewer sectional and more general meetings be arranged, so that the advanced knowledge of the specialists may be made available to the general practitioners and to specialists in other fields whose problems cross specialty lines. Second, that public auditoriums be sought for the holding of meetings, so that a large attendance may be accommodated and the information offered may be made available to all who would listen. This might do away with the more intimate practice of concentrating all session activities under one roof but it would certainly guarantee an adequacy of space for the larger number of members who turn out each year in quest of information and knowledge.

The Council of the Association has voted to hold the 1950 Annual Session in San Diego, where large public buildings will be available. This is a departure from earlier practices but we hope it will prove to be a beneficial move, geared to present and potential needs.

Industrial Fees—What Next?

Since early last year the California Medical Association has been striving to bring about the adoption of a schedule of fees for industrial injury cases that would be fair to the injured employee, the employer and the physician. However, numerous obstacles have been encountered and this goal is still distant.

The Association published its own recommended fee schedule early in 1949 and suggested that it be put into effect by all members. The insurance carriers countered by agreeing among themselves not to pay these recommended fees. The Association continued to recommend that such fees be considered fair and equitable and great confusion has arisen in billing for professional services at one figure and collecting, in some instances, at another. To the everlasting credit of many insurance carriers and many self-insurors, the fees set by the Association have been considered fair and equitable and have been paid without question. These people agree that the professional man is the best qualified individual to pass upon the fairness of fees for professional services.

More recently a committee of the Association's has been meeting with a committee representing a large group of insurance carriers and has attempted to arrive at a schedule which may be mutually acceptable. At this writing such a schedule has not been produced but hope springs eternal and this objective must not be discounted completely. At least, discussions have been held and some signs of progress have been seen.

If the movement to work out an amicable settlement should fail and the deadline of June 30, 1949, set by the Industrial Accident Commission should arrive, the prognosis is for complete chaos and, undoubtedly, a further effort at chiseling and fee-shopping by some insurance carriers. Members of the Association will be kept advised of all developments in this field and advised of any official decisions by the governing bodies of the Association. Right now, our fingers are crossed.

* * *

Letters to the Editor . . .

Let's Look at the Health Map

During the first decade of this century the doctors looked at the medical schools. The result of this long look was not only a Council on Medical Education and Hospitals and a survey of medical schools but a decline from 162, an all-time high, to 62, an all-time low in 1930, of four-year medical schools. Thus was eliminated a large number of schools of poor standards, inadequate training, and precarious financing.

On April 2 the Commonwealth Fund released the published report on "The Study of Child Health Services and Pediatric Education." This volume of 270 pages is the compiled work of practically every physician and dentist in the United States. The numerous maps, graphs, and charts depict graphically the status of health services and pediatric education in this country. It represents a herculean piece of work, and many people have said and are saying, "Another survey to be shelved." However, this need not be the case; instead it is and should be another evidence of doctors looking at themselves and the gaps in their work at a time when medicine is progressing at a rapid pace and when the entire world is looking to American medicine as the answer to its own problems. This study well might denote the half-way mark of the century, the first decade of which represents American doctors' first critical look at their system, and it can be the basis upon which doctors now chart the course to be taken in order to extend to all our people the benefits of modern health practice in the best American fashion.

The original promoters of the move in the Academy of Pediatrics to study the child health services in the United States premised this need with four main factors as the reason why children do not receive the desirable preventive and curative care compatible with present standards of pediatric practice. These were: (1) The parents are unable to pay for such services. (2) There is an unwillingness to use, or lack of knowledge of, the available facilities. (3) Services are not available wherever children live. (4) There are not enough physicians well trained in the medical care and supervision of children in all areas.

The study provides the graphic answers to these posed problems. There is a definite correlation between income and services, there is a mal-distribution of both facilities and personnel. There are discrepancies in training and the work required of physicians when they enter practice. There are also many somewhat surprising revelations in the study. Thus the supposedly vanishing general practitioners constitute two-thirds of the physicians practicing in the United States. The study reveals that the family physician carries three-fourths of the total burden of child care and one-third of his practice is devoted to children. Medical education is not oriented to train these physicians so that they are equipped to meet the type of practice that the community imposes upon them. Of the physicians graduating from medical schools almost half of the general practitioners have had little hospital training in pediatrics before entering practice. Thirty-five per cent have had one month or more hospital training in pediatrics, 33 per cent have had less than one year hospital training of any kind, and 32 per cent have less than one month's hospital training in pediatrics.

Another surprising revelation (and it should allay some of the fears of antagonists) is the extremely small volume of medical care provided by community health centers and clinics as compared with the great volume carried by private physicians and especially the general practitioner. Furthermore, although government public health clinics and conferences should fill the economic gaps in the health program, they in general follow the same pattern of aggregation in heavily populated areas as do the rest of medical services.

Official comments and plans are not yet ready for release. Dinner addresses at the time of the release of the report and discussions at preceding meetings, however, pointed to two things of interest. One of these especially emphasized by the President of the A.M.A., Dr. Roscoe Sensenich, was the importance of action at the local level, the formation of community health councils or committees to acquaint themselves and their neighbors with available facilities and resources and the inadequacies. Such stimulation need not wait for either over-all recommendations or financial support; it requires only local interest.

Part of the problem of good medical practice is that of rapid dissemination of newer knowledge to all areas. This phase was emphasized particularly in discussions on continued education, and at these meetings was stressed the necessity for maintaining fluidity, freedom for communities and areas to experiment, to try out various methods of approach as opposed to regimentation or adoption of frozen patterns. (Is not the real secret of American medical progress the more or less automatic avoidance of stagnation that is furnished by our fluid system of practice? Arrested development may occur not only in isolated areas far from medical centers but in isolated situations in large cities such as full-time work in health centers, or even among professors in their ivory towers devoting all their time to guinea pigs and gargoyles, unaware of more vital problems around them.)

Both of these ultimate aims point to the desirability of physicians and dentists in the United States looking at the map and starting to chart a course to equalize the benefits of training and practice in our country.

The book is called "Child Health Services and Pediatric Education." It is published by the Commonwealth Fund in New York and should be available through that foundation or through local medical book stores.

Each state is also analyzing the local material, publishing the findings and making recommendations. Some of these state reports have been completed, others are in the making.

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Program of the California Medical Association for the Improvement of Medical Care

The following program for the improvement of medical care was adopted by the Council of the California Medical Association at its meeting May 8, 1949, and approved unanimously by the House of Delegates on May 10, 1949. The program is a development of previous programs adopted by the Association for the improvement of the public health. The committee which prepared it received assistance from programs adopted by other state medical associations as well as from that of the American Medical Association.

1. *Health Insurance.* Further development and wider coverage by voluntary medical care and hospital plans (both medical association and insurance company sponsored) to meet the costs of illness. Aid to the indigent by utilization of these plans by the several counties, with local administration and determination of needs.
2. *Public Health.* Coordination and integration of all public health activities, except those of the medical services of the armed forces, under the state department of public health. Incorporation in local public health units of such services as communicable disease control, vital statistics, environmental sanitation, control of venereal diseases, maternal and child hygiene and public health communicable disease laboratory services.
3. *Rural Care.* Encouragement of the development by professional and lay organizations of medical and hospital services for rural areas, and of the integration of these services with regional county hospitals and small institutions.
4. *Mental Hygiene.* Continued development of the state program of mental hygiene.
5. *Chronic Diseases and the Aged.* Aid by the voluntary and state welfare agencies, combined with professional and other services, in the provision of care and rehabilitation of the aged, and those with chronic disease, and various other groups not covered by existing arrangements.
6. *Industrial and Preventive Medicine.* Greater emphasis on the program of industrial medicine, with increased safeguards against industrial hazards and prevention of accidents occurring on the highway, home and on the farm.
7. *Veterans' Medical Care.* Integration of veterans' medical care and hospital facilities with other medical care and hospital programs and with the maintenance of high standards of medical care, including care of the veteran in his own community by a physician of his choice. Cooperation of the C.M.A. with veterans' organizations in the continued development of good medical care.
8. *Health Education.* Health education programs administered through suitable local educational, health and medical agencies to inform the people of available facilities, and of their own responsibilities in health care.
9. *Medical Education and Personnel.* Promotion of private financial assistance to medical, dental and nursing schools and other institutions necessary for the training of specialized personnel required in the provision and distribution of medical care. Revision of income tax and estate tax laws so as to encourage people to donate needed assistance to medical and associated professional education.
10. *Medical Research.* Continued promotion of medical research through private grants to institutions equipped and staffed to carry on qualified research.
11. *Postgraduate Medical Education.* Expansion of the postgraduate medical training program of the California Medical Association, to assist practitioners in rural areas in keeping abreast of latest advances in medical science.

The New President-Elect

In electing Dr. Donald Cass of Los Angeles to the office of President-elect of the California Medical Association, the Association has done itself and the profession of medicine a service.

Dr. Cass, a native son of California, was born in Los Angeles, March 13, 1892. He received his education in the public schools of Los Angeles, Stanford University and the Stanford University School of Medicine, receiving his Bachelor of Arts degree in 1914 and the degree of Doctor of Medicine in 1917. He served an internship in Stanford University Hospital and immediately entered the United States Army, in which he served in World War I with the rank of first lieutenant, Medical Corps.

On June 29, 1917, he was married to Miss Leona Waite at Visalia. Dr. and Mrs. Cass have a charming family consisting of one daughter and two sons. Dr. Cass has been in practice in Los Angeles since 1919 and is an outstanding type of general practitioner. He has served on the staff of the Los Angeles General Hospital and was for four years instructor in medical diagnosis in the College of Medical Evangelists at Los Angeles. Among his contributions to the medical literature is an outstanding article published in *The Journal of the American Medical Association* and entitled "The Diagnosis, Treatment and Outlook of Patients with Circulatory Asthenia."

Dr. Cass has been very active in the work of the county and state medical associations, having served several terms as a member of the council of each organization. For many years he has been chairman of the Committee on Industrial Practice of the California Medical Association and has been largely responsible for the various industrial fee schedules. He was twice president of the staff of the Queen of Angels Hospital in Los Angeles and during World War II served as a senior surgeon in the United States Public Health Service. He is now serving his third term as a delegate to the American Medical Association, where his service has been outstanding.

The California Medical Association is indeed fortunate to have at its command the services of such a man as Dr. Donald Cass and may look forward confidently to an administration which will not only reflect credit upon himself but will serve his profession.

C.P.S. Administrative Members' Meeting

Two evening meetings of administrative members of California Physicians' Service were held during the C.M.A. convention in Los Angeles on May 8 and 10. Both were outstanding for the support and interest shown in the growth and adaptation of C.P.S. to better meet the needs of beneficiary and physician members.

The meetings were chairmanned by Dr. Lowell S. Goin, president of the C.P.S. board of trustees. In his opening speech, he referred to compulsory bills now pending not as "health" plans, but as "compulsory sickness taxes." He referred to an editorial which appeared in the San Francisco *Chronicle*, lauding C.P.S. for the new offer of memberships for individuals in 17 northeastern counties, and urged administrative members to take no actions which might induce a paper such as the *Chronicle* to reverse its stand regarding the ability of voluntary plans to stem the tide of compulsory sickness tax plans.

Dr. Chester L. Cooley, outgoing secretary of the board, presented a resume of action taken by the board during the eleven meetings held during the past year. He lauded the work of the fee schedule committee in the time and effort expended in eliminating inequities in present C.P.S. fees. He reported that good progress had been made toward establishment of a reserve fund as recommended by administrative members last year; and that the veterans' home town care program is continuing to meet with wide public and governmental acceptance. The appointment of special review committees, by individual county medical societies, has also progressed rapidly, Dr. Cooley reported.

Mr. William M. Bowman, C.P.S. executive director, gave the business report, which indicated that during the past fiscal year reserves have increased from $185,288 to $943,359, and that the surplus increase for the year was $758,071, as against $580,433 during the previous year. Bowman said the reserve for unreported claim is now $1,460,988, as against $1,091,444 during the year 1947-48.

Following these reports, Dr. E. Vincent Askey, outgoing C.M.A. President, introduced Dr. L. Howard Schriver, president of Associated Medical Care Plans, who presented an A.M.C.P. plaque to Dr. Goin in national recognition of the contribution and leadership of C.P.S. in the national field of voluntary health care. "Just ten years ago the doctors of California, through the California Medical Association, said: 'While the rest of the nation talks about it—let's go ahead and do the job. . . .' " He praised the administrative members for the record C.P.S. has written: for the example it has set for the plans of other states.

Following the presentation from the floor of resolutions, and the study and recommendations of the resolution committee, headed by Dr. Donald Cass of Los Angeles, the following were forwarded to the C.P.S. board of trustees for further consideration and final action:

(1) A resolution that the C.P.S. administration be instructed to secure additional actuarial and statistical information, for purposes of further study of C.P.S. costs and benefits.

(2) A resolution that physician members be required to submit a written notification of resignation, to be effective thirty days following the publication of the next printed directory of physician members. These directories are to be issued at least every six months.

(3) A resolution that income ceilings be changed to a $3,000 gross income for single persons and $3,600 gross income for members with dependents.

(4) A resolution that physician members be instructed to refer C.P.S. patients to physician-owned laboratories in the future.

Considerable interest was elicited in connection with a proposed new billing form (No. 9) for physicians. This would require the C.P.S. member himself to state his income and give his membership status, relieving the doctor of this responsibility.

The appointment to the board of Dr. Kendrick Smith of Los Angeles and Dr. John Rumsey of San Diego was confirmed by the administrative members. Dr. T. Eric Reynolds of Oakland and Dr. Frank A. MacDonald of Sacramento were nominated and elected to fill the terms vacated by Dr. Chester L. Cooley and Dr. A. E. Moore. Rt. Rev. Msgr. Thomas J. O'Dwyer was reelected to the board, and Thomas Hadfield of San Francisco, vice-president of the American Mutual Liability Insurance Company, was elected to fill the vacancy in the board requiring a non-physician member.

* * *

Progress in the Campaign Against Compulsory Health Insurance

The following is an address before the House of Delegates of the California Medical Association by Clem Whitaker of Whitaker & Baxter, directors of the National Education Campaign of the American Medical Association.

Everywhere we go, in the East and Middle West, Baxter* and I are asked to tell what has become known as "The California Story"—and you can be very proud of the high regard in which the California Medical Association is held.

If the national fight against Compulsory Health Insurance is won—and of course it *must* be won—the strategy and plans first developed here, in this House of Delegates, back in 1945 and 1946, will be a major factor in the victory.

Here, we decided, it wasn't enough to just beat a bill. We had to resolve a problem. We had to provide the people with prepaid medical care!

Nationally, that same decision has become one of the foundation stones of the campaign. American medicine isn't going to be content just to beat a bill. American medicine is going to help the American people resolve a problem!

Here, in California, we developed the theme—THE VOLUNTARY WAY IS THE AMERICAN WAY—and then we proceeded to build the Voluntary Systems and give substance to that theme.

Today, that theme—first put down on paper in this hotel, in 1945—has become the slogan of the national campaign. Soon millions of Americans will know that theme because there's a new pamphlet, which Baxter has written, running off the presses now — entitled: THE VOLUNTARY WAY IS THE AMERICAN WAY!

Within another year, let us assure you of this, there won't be any American who doesn't know that he can buy budget-basis medical care for his family—and there won't be any state in the United States without a vigorous promotion campaign for Voluntary Health Insurance.

Sometimes one has to leave his home state to get proper perspective on it—and to have a proper appreciation of the stature of its leaders.

I wish you could all know, as we know, how well the country thinks of California medicine—and the progressive program which California doctors have sponsored.

I wish you could know the pride which we feel when we see the esteem in which your leaders are held.

I wish you could know, too, how the other states feel about the tremendous strides which California Physicians' Service has made—and how eager they are to pattern after it.

Here, at home, in close perspective, we see all the imperfections; we know all the little, daily vexations —but go to New England, as I did recently, and you'll get a respectful, attentive audience every time you mention the program of California medicine.

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*Leone Baxter of Whitaker & Baxter.

There's a lot of local pride in all the states, as there should be, and many of the more progressive states today are backing ambitious medical programs which are winning acclaim, too, and which will be tremendously helpful in stemming the tide of socialization.

There's going to be some very vigorous rivalry between the states to develop new and better means of combatting political medicine — and that's a healthy development which Whitaker & Baxter certainly are encouraging.

All over this land, doctors are learning to practice on the body politic—and are becoming very proficient in the art of political persuasion. We have the evidence of their work in our files—and every day brings a new deluge of letters, not just from the officers of medical societies, but from rank and file doctors everywhere who have enlisted in the fight to save their profession.

Perhaps you still wonder about the doctors who seldom attend their medical society meetings; about the doctors who are so completely absorbed in their practice and their academic and scientific pursuits—you wonder whether they will respond, now that the decisive battle is nearing.

We can give you some first-hand evidence on that score.

There are still thousands of doctors who apparently don't know their house is on fire, but every day a few more smell the smoke—and join the fire department!

We are hearing from them at the rate of about 3,000 letters a week—and we have no way of knowing, of course, how many thousands of letters, phone calls and personal enlistments are being received in county and state medical societies.

By the way, if some of you don't hear from us quite as promptly as you think you should, when you write in for information, that load of correspondence is one of the reasons.

Our outgoing mail, including our mass-mailings to community leaders over the country, has become so heavy that we have had to buy a power-driven stamp-cancelling machine to handle the volume. Special mailings to special groups, just for the next two weeks, will total over a million pieces.

But let me give you a few clues as to how medicine is responding, even at this early stage of the campaign — and the magnitude of a nation-wide campaign, of course, means that it takes longer to get the wheels in motion.

Orders for the new poster of the Fildes painting, "The Doctor," captioned, "Keep Politics Out of This Picture"—which is to be displayed in doctors' offices, as the keynote of our campaign—are rolling in at the rate of about *1,000 a day*. And we are now filling the orders for this poster on the same day they are received.

Our objective is to have 50,000 of these posters actually up, on display in doctors' offices, within the next 60 days. If that goal is achieved, we will know that at least 50,000 doctors in America have joined the crusade to keep American medicine free—and you may be sure that President Truman and the members of Congress will know it, too!

But if we are really determined to build an impregnable defense against socialization; if we really want to command new respect for the medical profession in the halls of Congress and throughout the nation, we can't stop when we achieve that objective.

Eventually—it may take six months, or even a year, to achieve this goal—we need 100,000 doctors' offices in America displaying the Fildes poster.

That means we need help from all of you—and all other leaders in medicine—in lighting the crusading fires.

To the men of medicine, this poster should become *a symbol of enlistment*—a notice to their profession and their patients that they have taken their stand against political medicine!

When that poster is on display, it should mean that no patient ever will leave that office before the doctor has taken a minute or two of his time to tell the story of Compulsory Health Insurance—and the disastrous results it would bring, if enacted in this country.

It should mean, too, that every patient who needs Voluntary Health Insurance will be encouraged by the doctor to get the type of coverage that best suits his requirements.

Because the poster will quicken interest of the people waiting in the doctor's reception room, Baxter has a special pamphlet on the press now, with a miniature reproduction of the Fildes painting on the cover. It is a brief, popular treatment of the subject, which can be read on the run—and *two million copies* will be available for shipment to state and county medical societies within the next ten days. This pamphlet, which also can be used as a letter-enclosure, is designed especially for use in doctors' offices.

You may think, as you listen to these plans, that we want every doctor to become a campaigner—and every doctor's office to function as part of a nation-wide pamphlet distribution system. Let's be frank: That's exactly what we want—and that's what your campaign desperately needs!

This isn't just another skirmish in the fight against socialization.

This is the decisive battle that will determine the fate of American medicine for generations to come.

Within just a few days, the congressional hearings open in Washington — and once they have started, there will be no letup in this fight until one side or the other has been decisively defeated.

The next two or three years will determine whether you are to remain in the private practice of medicine. *And if the decision once goes against medicine, there will be no turning back; there will be only a tightening of the lockstep you walk in!*

Your professional life is at stake! The health of America is at stake!

Our liberty—and everything we count important—is in jeopardy!

This isn't just a battle to save medicine. This is the most crucial battle that will be fought in our lifetimes—to save America, to turn back the tide of Socialism and despotism before it is too late.

This is an emergency—and we are calling all doctors!

It is without doubt the greatest emergency any of you ever have confronted in all your years of practice.

Not just one life hangs in the balance, but the life of a nation is in your hands—a nation that has become the last hope of all the liberty-loving people of the world.

Is it then too much to ask that every doctor become a campaigner?

There isn't a man or woman in medicine worthy of the high ideals of your profession who wouldn't respond to an emergency call if the life of a person, or a family, or a community was in danger.

But this emergency is so vast that it is hard to grasp.

If it is even hard to arouse many of the doctors of America, think how much harder it is going to be to arouse all the people of this country to the full implications of this struggle.

This truth we know—and this truth we must some way make America know:

When medicine is socialized; when doctors and their patients are regimented, the beginning of the end is in sight. It is one of the final, irreparable steps toward complete state socialism. And at the end of that road is human degradation and misery . . . loss of incentive, loss of human dignity, loss of everything that means most to free men.

There are many men who will call us extremists when we make such statements — when we rip through the pages of obscure text in the Truman program and reveal the real intent of the act. They are cousins of the same men who saw no danger in Compulsory Health Insurance when it was first adopted in Great Britain. And today Britain is plunging headlong toward a regimented society that will blot out every vestige of liberty for the British people, unless the tide is turned back.

Perhaps some of your doctor friends, when you tell them about this—if they are impressed with the gravity of the issue—will exclaim: "What is A.M.A. doing about this?" "What is our national campaign headquarters doing?" "What happened to our $25?"

We want to answer those questions frankly, because every doctor has a right to know what's going on in Chicago.

First, let us make one emphatic statement for the records, because A.M.A. needs your confidence and your aggressive support—and you need a militant, fighting A.M.A. leading this battle:

A.M.A. may have had many shortcomings in the past. It may still have some...because any great organization usually has. But the new A.M.A. that is leading this battle is a heads-up, fighting organization that will gladden your hearts. It has found that it can step militantly into this greatest public issue of our time, without sacrificing an iota of its dignity—or of its significance as a great scientific institution.

The Board of Trustees and the Coordinating Committee of A.M.A., to whom we look for authority in the management of the campaign, have backed us up every step of the way, even on difficult policy decisions which might bring down criticism on all of us. Dr. Elmer L. Henderson, the chairman of the Board of Trustees and also chairman of the Coordinating Committee in charge of the campaign, is a grand soldier, with a fighting heart and a tireless devotion to his job. And Dr. Lull, the A.M.A.'s General Manager, whom most of you know, is as fine a general today as he was when he wore Uncle Sam's uniform.

I am making this statement tonight because Whitaker & Baxter are in Chicago only because of the confidence which many of you imposed in us—and because this issue to us seemed to transcend every other consideration.

We have no desire to stay in Chicago beyond this term of servitude—and the sooner we can get this job done and get back to California, the happier we will be. But because you got us into this, we think you ought to know that we have had splendid support from A.M.A.—and we hope with all our hearts that out of this fight will come a strong, united medical profession, with confidence and pride in its leadership. Of course, it can't be disputed that having a few top-ranking California doctors in the higher councils of A.M.A. may have something to do with the happy report we are rendering.

If, by this statement, I have given the impression that all is sweetness and light in Chicago—and that every day dawns brightly—I want to correct that impression immediately.

Since the first day we arrived in Chicago it seems there has been a crisis every hour, on the hour—with minor revolts and disruptions sandwiched in between. We never dreamed there could be so many internal problems in internal medicine! But some of the biggest disruptions and problems, which threatened the success of the campaign, have been entirely cleared away—and other serious problems are slowly yielding to treatment.

More than anything else, it is imperative that we have a united front—and that is one of the objectives toward which we have been working, with the warm-hearted backing of A.M.A.'s policy-making boards.

One policy that is firmly established is this:

There are going to be no punches pulled in this battle. If you read Dr. Henderson's reply to President Truman, you will know what I mean.

American medicine has been a whipping-boy for political demagogues far too long—and this fight can't be won by policies of compromise or appeasement. A few doctors thought we were too tough with the President, but most of the mail, I am glad to report, indicated that the doctors liked the militancy of Dr. Henderson's statement.

Already a shift has quietly started in this campaign—and medicine is gradually emerging from a defensive position. That shift won't be accomplished overnight, because the advocates of socialization, with the White House and the Federal Security Administration as sounding boards for their propaganda, have powerful facilities to reach the people. But before this year is out, I think you will find a great change in public sentiment.

All of us in Chicago, since the campaign began, have been doing our utmost to broaden the front—and win new allies for medicine. That work is starting to pay dividends. The action of the General Federation of Women's Clubs in going on record against Compulsory Health Insurance was a stunning defeat for President Truman and Oscar Ewing. They had sent a staff of government department heads and workers to the convention, hoping to forestall our drive for Federation action in support of medicine's cause. Even Mrs. Roosevelt and Senator Pepper showed up at the convention, but when the votes were counted only three of the 2,000 delegates supported the Truman program. That is a dramatic demonstration of the clear thinking of foremost women in this country. It is demonstration, too, of the power of doctors—and doctors' wives—when they really go to work . . . and it should give all of us increased confidence.

Only a few days ago another powerful organization—the National Fraternal Congress of America, representing several hundred of the strongest lodges and fraternal orders in the nation—also took its stand beside the medical profession and went on record against Compulsory Health Insurance.

The American Farm Bureau Federation, the American Legion, the American Bar Association—and scores of other powerful organizations—have come into the fight against socialization . . . so that medicine need not stand alone.

HELP FROM OTHER ORGANIZATIONS

In the past 10 days, the list of organizations supporting medicine's position—in the country at large—has jumped from 178 to 518. The organization drive in the states and counties has rolled into high gear in most sections of the country, and we have an objective here, too: By the end of the year, we hope there will be at least 5,000 organizations in America on record against Compulsory Health Insurance—and in favor of Voluntary Health Insurance.

Likewise the educational work with some of the powerful *national magazines* and newspapers, which had previously been unsettled in their position on this issue, has started to bring results. We're getting some barbs along with the editorial endorsements of medicine's position, but we *are* making progress—and overcoming misunderstanding and ill will of long standing.

When the chips are down, and the critical roll-calls come on this issue, I think you will find that medicine will have staunch support.

Now what about that $25? What's that going into? Thus far our expenditures have been comparatively modest, but our staff has been built and trained now, the presses are running, with orders that total millions of pieces, and costs are mounting!

If all goes well, we will issue and distribute *100 million pamphlets* during the next twelve months—probably the heaviest pamphlet barrage ever laid down in America, except during a presidential campaign.

THE HIGH PRICE OF LIBERTY

That costs money. It takes a lot of $25 contributions to buy a million pamphlets—and nothing we issue is in quantities of less than a million. That's a minimum order when you are splitting the shipment between 48 states—and most of our mass-mailing pieces will run into many millions of copies.

Our opponents have criticized us for having too much money. But they would *pity* us if we didn't have the money! In a fight like this, no matter what we do, there'll be lots of bitter criticism. That's part of the breakage in a battle for survival—and this is that kind of battle.

No matter what this campaign costs in money, it will cost much more in time and energy—and in tireless work by doctors and thousands of others all over the country.

The $25 a doctor gives, in most instances, will be the smallest part of his contribution. The time he gives away from his practice; the evenings he spends away from his family, addressing meetings; the hours invested in moulding public opinion for his profession—these will all be costly contributions.

But no matter what the cost, in money, in energy, in frustrations and irritations, and even in damage to health, the cost will still be just a fraction of the terrific price we would pay if this fight were lost.

We have fought two world wars in defense of our liberty, so we have no illusions about the cost of freedom.

The *price* of liberty comes high—but the *loss* of liberty; that's a price none of us can afford to pay.

Let us give you this strong, personal assurance:

This fight *can* be won—and it *will* be won! It simply *must* be won!

And in the winning of it, all of you—and all of the other doctors, throughout America, who get into the battle—will contribute to the well-being of this nation in greater measure than you ever have had the opportunity to do before.

This is the greatest challenge any of us ever has confronted. With socializers on the march all over the world, *we* have been given the task of reversing that trend. That's the stupendous responsibility—and the wonderful opportunity—which has been given the doctors of America. It is an opportunity to change the course of history . . . to defend our good way of life, and to leave a priceless inheritance to generations yet unborn. American medicine, I am confident, will be equal to the job!

Two U.S. Senators Attack Compulsory Health Insurance

Two United States Senators—a Democrat and a Republican—joined recently in a vigorous attack on President Truman's plan for federal compulsory health insurance, describing it as a vital issue that transcends all political party lines.

Senator Allen Ellender, Louisiana Democrat, and Senator Harry P. Cain, Washington Republican, condemned the plan as a dangerous proposal which would create a mammoth Government bureaucracy, provide inferior medical care, impose an unpredictable tax burden on the people and pave the way for the ultimate regimentation of our entire national life.

The two Senators spoke before 600 California business, farm and civic leaders at a dinner meeting held in the Palace Hotel under the sponsorship of the California Medical Association and presided over by Dr. Ray Lyman Wilbur, former president of Stanford University. Their addresses were broadcast over a western regional radio network.

"Compulsory health insurance will do violence to our way of life," Senator Ellender said. "It will destroy initiative, incentive, and freedom of action, the handmaidens of a system that has given us the highest standard of living and the best medical care of any nation on earth."

Senator Cain declared that the adoption of compulsory health insurance would regiment not only American doctors but also American patients—"and that means every man, woman, child, and infant in this country."

"As a member of the Senate who has observed, at close quarters for 13 years, the inefficiencies of Government administration," Senator Ellender said, "it requires no stretch of my imagination to picture the chaos and confusion, and the enormous administrative cost of a medical program conducted under political direction."

Politically-controlled medical systems "hamstring both doctors and patients with a frustrating maze of Government regulations and serial-number medical methods," according to Senator Cain, who added:

"Those who suffer are the people who are really sick and who need careful, personal attention at the proper time—not at a time and in a manner prescribed by a Government clerk or a mimeographed regulation. The inevitable, tragic result of such an impersonal system is a progressive decline in the people's health."

Senator Ellender declared that "the loudest cries for socialized medicine have come from the Government planners, always seeking another experimental toy; the Socialists, who openly advocate absolute government control; the Communists, who support any proposition that may disrupt our economy and ripen our country for revolution; the loafers, who seek any opportunity to get something for nothing."

Commenting that the proponents of compulsory health insurance "dislike to be pinned down on such practical matters as the cost of their scheme," Senator Cain said that numerous experts on medical economics, public health, and taxation have predicted "ultimate annual costs ranging from 10 to 18 billion dollars, a 6 per cent payroll tax just to get the system in operation, and an eventual paycheck tax rate of 10 or 12 per cent."

Declaring that suggestions of extremists must be rejected and that a solution must be found within the framework of the free enterprise system, Senator Ellender said:

"I call upon you, the doctors, and you, the people, to come forth and assert yourselves. You will find a substantial majority of your law-makers eager to cooperate with you in the development of a sound and adequate program, one that will accomplish the purpose without extinguishing the light of freedom that has made America great."

Senator Cain pointed to the rapid growth of voluntary health insurance, describing it as the truly American way to cushion the financial burden of sickness. He reported that 55 million people now have 80 million policies giving them the kind of hospital, surgical, or medical coverage they want.

"When we look at the record of our national progress in the field of voluntary health insurance," Senator Cain said, "it becomes crystal clear that the American people are meeting this problem and neither need nor want governmental interference."

Council Meeting Minutes

Tentative Draft: Minutes of the 358th Meeting of the Council of the California Medical Association, San Francisco, March 5-6, 1949.

The meeting was called to order by Chairman Bruck at 8:00 p.m., Saturday, March 5, 1949, in Room 261, St. Francis Hotel, San Francisco.

Roll Call:

Present were President Askey, President-Elect Kneeshaw, Speaker Alesen, Vice-Speaker Charnock, Councilors Bruck, Ball, Crane, Henderson, Ray, Lum, Pollock, Green, Cherry, MacLean, Hoffman, Shipman, Bailey and Thompson, and Secretary Garland.

A quorum present and acting.

Present by invitation were Executive Secretary Hunton, Legal Counsel Hassard, Mr. Ben Read, executive secretary of the Public Health League of California, Messrs. Clem Whitaker, Clem Whitaker, Jr., and Ned Burman of public relations counsel, Assistant Executive Secretary Wheeler, Field Secretary Clancy, county society executive secretaries

Glenn Gillette of Fresno, Rollen Waterson of Alameda, Frank Kihm of San Francisco, and Kenneth C. Young of San Diego; Dr. Dwight H. Murray, chairman of the Committee on Public Policy and Legislation and Dr. Donald Cass, chairman of the Committee on Industrial Practice.

1. *Minutes:*

(a) Minutes of the 357th meeting of the Council, held December 18-19, 1948, were approved.

(b) Minutes of the 213th meeting of the Executive Committee, held January 23, 1949, were approved.

2. *Membership:*

(a) A report of membership, showing 5,877 dues paid, 3,568 members whose 1949 dues have not yet been received, was received and ordered filed.

(b) On motion duly made and seconded in each case, eleven 1947 members whose 1948 dues have been received since the last Council meeting were voted reinstatement as active members.

(c) On motion duly made and seconded in each case, 18 applicants for Retired Membership were voted so elected. These were:

Alameda County: George T. Honaker, Charles E. Mooser.

Los Angeles County: Henry J. Andrews, Leslie C. Audrain, Mary Hess Brown, Samuel K. Jamentz, Ernest Marshall Johnstone, E. D. Kremers, Frank Edison Long, Ray Robert Miller, Richard F. Mogan, Arthur C. Thorpe.

San Diego County: Thomas F. Wier.

San Francisco County: George K. Herzog, G. H. Mize, Kaspar Pischel, Hugo A. Wahl, John West Wilson.

Ventura County: Walter F. Mosher.

(d) On motion duly made and seconded in each case, nine applicants were elected to Life Membership. These were:

Alameda County: A. M. Field, J. R. Masterson, A. M. McIntosh, Roderick O'Connor.

Humboldt County: Eugene V. Falk.

Los Angeles County: Ralph W. Bucknam, Henry H. Lissner.

San Diego County: John Francis White.

Tehama County: Frank L. Doane.

(e) On motion duly made and seconded in each case, 25 applicants were elected to Associate Membership. These were:

Alameda County: N. N. Ashley, Susan Danielson, Jesse C. Edwards, Thomas O. Lake, Frederick C. Mackenbrock, Jonas N. Muller, Ralph W. Newton, Jr., Harriet West Nielson, Alberta W. Parker, William O. Reinhardt, Edward S. Rogers, Frederick Sherwood, Richard S. Yocum, David Van der Slice.

Riverside County: Magdalene H. Corr, Robert S. Westphal.

Sacramento County: Herbert Notkin.

San Bernardino County: Virgil M. Pinkley.

San Francisco County: Felix C. Mapa.

Santa Clara County: Kristian Johnson.

Santa Cruz County: Joseph A. McMullin.

Ventura County: Alexander Auger, Gwen McCullough.

Marin County: Cornwall Everman.

Santa Barbara County: Charles G. Baird.

(f) On motion duly made and seconded in each case, 20 applicants were granted a reduction of dues because of protracted illness or absence from practice in pursuit of postgraduate instruction. These were:

Alameda County: Max Lowell, Jack Stein, Roy P. Stoops.

San Diego County: Robert E. Austin, Bert Dannenberg, Harold L. Fisher.

San Francisco County: Robert E. Berner, Barnet E. Bonar, Patrick Butler, Leo Eloesser, Floyde J. Field, Frederick G. Gillick, Jesse Jacobsen, Hedda Kornfeld, Harold LeBlond, Neil McCloy, Maury Misrack, Leibert J. Sandars, Reagan South, Emily Woelz.

(g) Discussion was held on the need of aiding medical students and house officers to ascertain basic aspects of medical economics and it was regularly moved, seconded and voted that medical students and house officers be urged to form their own organizations for self-education in the principles of sound effective private practice, and that the A.M.A. be asked to take appropriate steps to encourage this activity.

3. *Financial:*

(a) A report of bank balances as of March 4, 1949, was received and ordered filed.

(b) A balance sheet as of February 28, 1949, was received and ordered filed.

(c) Reports of revenues and expenditures for February and for the eight months ended February 28, 1949, for the Association and for *California Medicine* were received and ordered filed.

(d) The Executive Secretary reported that to date $126,707.50 had been received from members toward the A.M.A. 1949 assessment.

4. *Public Relations of the American Medical Association:*

Dr. John W. Cline appeared by invitation and discussed the program for participation by state medical associations in the nationwide public relations program of the A.M.A. He reported that Drs. M. L. Montgomery of San Francisco and R. O. Bullis of Los Angeles had been appointed members of the "Committee of 53" of the American Medical Association, the national group of state representatives to serve as liaison officers between the A.M.A. and the state associations in the national public relations campaign. Dr. Cline asked that these appointments be confirmed and that provision be made for holding meetings in the northern and southern areas for business and civic leaders, to advise them on the aims of the A.M.A. program.

On motion duly made and seconded, the appointments of Drs. Montgomery and Bullis on the A.M.A. committee were confirmed.

On motion duly made and seconded, it was voted to hold meetings in the northern and southern areas to acquaint business and civic leaders with the objectives of the campaign. A chairman for this purpose is to be appointed by the Executive Committee. (Dr. Ben Frees of Los Angeles was appointed by the Executive Committee.)

5. *Industrial Medical and Surgical Fees:*

(a) Dr. Donald Cass, chairman of the Committee on Industrial Practice, discussed the status of the Association's proposed schedule of fees for industrial medicine and surgery and pointed out that the Industrial Accident Commission had tabled the Association's petition for adoption of a new fee schedule and had announced its intention of honoring the 1946 fee schedule only until June 30, 1949. Dr. Cass also stated that some industrial insurance companies had decided that the 1946 fees should apply in all cases and that the Association's recommendation to its members that the proposed 1949 fee schedule be put into effect February 1, 1949, had been offset by the decision of the insurance carriers to honor only the earlier schedule. He suggested that a committee might be appointed to meet with a committee proposed by the insurance carriers with a view toward securing full adoption of the Association's new schedule of fees.

On motion duly made and seconded, it was voted that a committee be appointed to meet with a committee representing the insurance carriers, to attempt to secure full adoption of the Association's fee schedule, the committee to consist of Dr. Cass as chairman, Drs. Carl Hoag, Ross Harbaugh and Charles O. Bechtol from the northern area and Drs. George Jones, Carl Johnson and John Gillis from the Los Angeles area.

On motion duly made and seconded, it was voted that a letter be sent to all members of the Association, outlining the status of the new fee schedule, suggesting that members continue to bill for industrial cases on the basis of the new schedule but that members be permitted, if they so wish, to accept up until June 30, 1949, payment from insurance carriers on the basis of the 1946 schedule.

(b) Dr. Cass presented to the Council a manual prepared by a committee under the chairmanship of Dr. Packard Thurber, dealing with proposed standardization of joint function measurement. On motion duly made and seconded, it was voted that the Council accept this manual and commend Dr. Thurber and his associates for their work.

6. *Legal Department:*

(a) Mr. Hassard presented a request from a member, inquiring into the consideration of ethics where physicians serve as limited partners in a pathological laboratory operated by or with a licensed laboratory technologist as the sole general partner and where profits are distributed on the basis of ownership and not for work directed to the laboratory. A special committee was named to draft a reply to this question and reported (Sunday, March 6, 1949) its decision, which held that such a partnership must be construed as in violation of the principles of medical ethics in that it would constitute the rendering of services in conjunction with and for the profit of a layman. A reply along these lines was submitted and approved.

(b) Mr. Hassard reported that the Association of California Hospitals was considering the formation of a cooperative insurance company to issue professional liability insurance for hospitals and was inquiring into the desirability of including in such insurance surgeons operating in the hospitals. It was regularly moved, seconded and voted that the hospital association be notified that the California Medical Association does not recommend the inclusion of physicians in such a proposed hospital policy.

(c) Mr. Hassard also reported that the California Supreme Court has not yet decided Sinz v. Owens, a case involving standards of practice applicable to general practitioners.

Recess:

At this point, 11:45 p.m., the Council recessed until 9:00 a.m., Sunday, March 6, 1949.

Reconvention:

The Council reconvened in Room 261, St. Francis Hotel, San Francisco, at 9:00 a.m., Sunday, March 6, 1949.

Roll Call:

On roll call, all those noted present March 5 were present. In addition, Councilor Anderson and Editor Wilbur were present.

Present by invitation were those listed March 5, with the exception of Dr. Donald Cass.

Present by invitation during a part of the meeting were Dr. Wilton L. Halverson, state director of public health; Dr. C. L. Cooley, secretary, Mr. William M. Bowman, executive director, and Mr. John McMahon, assistant director, of California Physicians' Service; Joseph Donovan, executive secretary of the Santa Clara County Medical Society, and Mr. Glenn O. Everman, director of a hospital fund-raising organization.

A quorum present and acting.

7. *Memorial to Los Angeles Chamber of Commerce:*

On motion by Cherry, seconded by Henderson, the Council voted unanimously to adopt a resolution commending the Los Angeles Chamber of Commerce for its constructive efforts in behalf of the extension of voluntary sickness insurance and in opposition to compulsory sickness insurance.

8. *Council Appointments:*

(a) On motion duly made and seconded, Dr. Edgar Wayburn was appointed a member of the

Editorial Board of *California Medicine* to fill the unexpired term of the late Lambert B. Coblentz.

(b) On motion duly made and seconded, Dr. Robert Dennis was appointed a member of the Committee on Scientific Work to fill the unexpired term of Dr. William Russell, who has moved from the state.

9. *Tuberculosis Control Program:*

(a) Dr. H. Gordon MacLean reported for a special committee appointed to study a proposed tuberculosis control program; copies of the committee report had previously been distributed. Several additions and amendments were offered and approved and the amended report, on motion duly made and seconded, was approved.

(b) Discussion was held on the part to be played by county medical societies in cooperating with state and federal authorities in conducting mass chest surveys and it was agreed that the county societies should be fully represented on the operating committees conducting these surveys.

10. *Other Organizations:*

(a) Discussion was held on the existence of the increasing number of so-called "health and medical associations" and it was pointed out that certain of these were operated by laymen, did not come under the purview of the state insurance commissioner and did not offer a free choice of physicians to subscribing members. Legal counsel pointed out that any physician who contracts with such organizations might be held guilty of violating provisions of the medical practice act, as well as the principles of medical ethics. It was reported that a bill now before the state Legislature would provide for the control of such organizations by the insurance commissioner. On motion duly made and seconded, it was voted that the Association lend its support to this legislation and notify its members, through letters to county society secretaries and an editorial in the journal, of the dangers inherent in closed panel proprietary organizations.

(b) Dr. Hoffman reported on his meeting with the California Ambulance Association, paid tribute to the motives followed by this new organization in formulating standards of service and noted the desire of the ambulance operators to make their services conform with the wishes of physicians. The association at its meeting adopted a resolution in opposition to the establishment of a system of compulsory sickness insurance and instructed its attorneys to work for the defeat of state legislative bills toward this end.

11. *California Physicians' Service:*

Dr. C. L. Cooley, secretary of California Physicians' Service, reported that a new C.P.S. fee schedule was about ready for adoption, that physician membership in C.P.S. is now about 9,600, and that the board of trustees is considering the advisability of changing the income ceiling for service coverage to a gross family income of $4,000 annually instead of a net of $3,000. Dr. Cooley also placed before the Council the possibility of financing a trip to Great Britain for a physician, an accountant and a writer who would review the practice of medicine in that country under the government socialized scheme and prepare a report for presentation to both professional and legislative bodies. There was discussion of this project and it was regularly moved and seconded that the Association provide financing for it. On vote, the motion was lost.

Mr. W. M. Bowman distributed copies of the C.P.S. financial report as of January 31, 1949, which showed a balance of $930,768 in the unit stabilization fund reserve. As of February 28 this figure was tentatively calculated at more than $1,000,000.

12. *New Mexico Physicians' Service:*

Mr. Hunton reported that executives of California Physicians' Service had reviewed the operations of New Mexico Physicians' Service in conformity with the request of the Council and had made numerous suggestions for improving the operating position of the organization. He also read a letter from Dr. John Conway, N.M.P.S. president, which stated that the financial position of N.M.P.S. was declining and that a proposal was under consideration to liquidate the organization and turn existing business over to a group of insurance carriers which would provide indemnification coverage, with a service type of coverage to members under an agreed-upon income ceiling at fees approved by the physicians. Such liquidation would produce between $8,000 and $10,000 for repayment of the funds advanced by the California Medical Association, with the possibility of additional funds for this purpose arising from the insurance companies' operations. Continuation of the present program would require additional financing. After full discussion it was regularly moved, seconded and voted that the C.M.A. state to N.M.P.S. its inability to advance further funds and to urge it to undertake the best available means of liquidation which would assure a continued service to the public and return the greatest possible credit to apply against loan funds advanced.

13. *Appearance of Mr. Glenn O. Everman:*

Mr. Everman appeared before the Council and urged that physicians take an active part in civic affairs, so that such ventures as privately endowed or erected hospitals might secure wide support.

14. *C.M.A. Employees' Retirement Program:*

Dr. Charnock, chairman of the Council committee on employee retirement, proposed that a formula be established for providing severance compensation to female employees leaving the Association for reasons acceptable to the Council. After discussion it was moved, seconded and voted to consider this proposal after further investigation.

15. *Proposed Model Hospital Radiology Contract:*

Mr. Hassard reviewed the situation since completion of the proposed model contract for hospitals and radiologists. On motion duly made and seconded, the Council voted to approve publication of the proposed contract, and to pursue efforts to make such a contract effective.

16. *Special Committee on Alcoholism:*

A report by the Council's special committee on alcoholism was presented and discussed. On motion duly made and seconded, it was voted to accept the report, order an abstract of it printed in the preconvention issue of the journal and extend to Dr. Cullen Ward Irish, chairman, and the members of the committee the warm commendation of the Council for the production of an outstanding report. Dr. Murray reported that a bill now before the Legislature would create a bureau on alcoholism in the State Department of Public Health and provide an advisory committee on which the Association would be represented.

17. *California Conference of Local Health Officers:*

Drs. H. D. Chope and S. F. Farnsworth, health officers of San Mateo and Alameda counties, respectively, appeared before the Council, reported on the formation of this organization under terms of legislation adopted in 1947 and requested that a joint committee be established as liaison between the organization and the Council. On motion duly made and seconded, it was voted that a Council committee be named for this purpose, the chairman to make appointments.

18. *Public Policy and Legislation:*

Dr. Murray, Mr. Read and Mr. Hassard discussed several bills pending before the California Legislature and pointed out that 4,939 bills and resolutions have been introduced in this session, 452 of them having been found to have a bearing on the public health or the practice of medicine.

Mr. Read reported that the Hon. Jonathan J. Hollibaugh, Assemblyman from Huntington Park, has been active in stressing the financial aspects of proposed compulsory health insurance proposals in his current campaign to secure reduced expenditures and taxes. On motion duly made and seconded, it was voted to express to Mr. Hollibaugh the appreciation of the Council for his efforts in this direction.

19. *Annual Session:*

Discussion was held on the advisability of suggesting that the President of the Association be advised to discontinue the reception held prior to the annual President's Dinner. The problem of finding suitable space for, as well as defraying the cost of, this reception has risen greatly in recent years, and now seemed an undue financial burden on the President. On motion duly made and seconded, it was voted that this reception be cancelled as a feature of the annual session.

20. *U. S. Navy Medical Officer Needs:*

Report was made that the U. S. Navy has notified the Association that it needs 122 additional medical officers in the California area and requests the continued cooperation of the Association in securing these physicians. Such cooperation has previously been voted.

21. *World Medical Association:*

A request from the World Medical Association for the C.M.A. to become a member through the payment of a $2,000 fee was read and discussed. On motion duly made and seconded, it was voted to defer action on this request at this time but to make provision for the distribution of World Medical Association literature at the annual session for the benefit of members who might wish to become individual members of W.M.A.

22. *Nurse Recruitment:*

A request for the Association to contribute $2,500 toward a fund to be used in encouraging the registration of additional student nurses was discussed and it was regularly moved, seconded and voted to defer action pending information concerning conjunct contributions.

23. *Practical Nurse Legislation:*

A request for the Association to be represented at a meeting to discuss the several proposals now before the Legislature to establish a system of practical nurse registration and control over practical nurse training was discussed and it was regularly moved, seconded and voted to refer this matter to the Executive Committee for further consideration.

Time and Place of Next Meeting:

It was regularly moved, seconded and voted that the time and place of the next meeting be at the call of the chairman.

Adjournment: 6:10 p.m., Sunday, March 6, 1949.

In Memoriam

Bonoff, Karl Max. Died in Los Angeles, May 11, 1949, aged 57, in an automobile accident. Graduate of the College of Physicians and Surgeons, Los Angeles, 1914. Licensed in California in 1914. Dr. Bonoff was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Church, Burt Thomas. Died in Los Angeles, March 12, 1949, aged 51. Graduate of the University of Nebraska College of Medicine, Omaha, 1923. Licensed in California in 1941. Dr. Church was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Cottle, Cassius Clay. Died in Los Angeles, April 28, 1949, aged 84. Graduate of Rush Medical College, Chicago,

1889. Licensed in California in 1916. Dr. Cottle was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

✤

DECKER, CHARLES WILLIAM. Died in Pomona, March 25, 1949, aged 72. Graduate of the University of California School of Medicine, Los Angeles, 1906. Licensed in California in 1906. Dr. Decker was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

DEPUY, CLARENCE AUGUSTUS. Died in Oakland, May 3, 1949, aged 77, of carcinoma of the prostate. Graduate of the College of Physicians and Surgeons of San Francisco, 1905. Licensed in California in 1906. Dr. DePuy was a retired member of the Alameda County Medical Association, and the California Medical Association.

✤

FARNHAM, HARRIET JEAN BOWER. Died in Glendale, April 4, 1949, aged 50, of metastatic carcinoma. Graduate of the University of Minnesota Medical School, Minneapolis, 1923. Licensed in California in 1923. Dr. Farnham was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

KOTLER, MORRIS JOHN. Died in San Diego, May 23, 1949. aged 49. Graduate of Washington University School of Medicine, St. Louis, 1928. Licensed in California in 1939. Dr. Kotler was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

MCCLINTOCK, GEORGE LORENZ. Died in San Diego, May 23, 1949, aged 55. Graduate of the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1917. Licensed in California in 1936. Dr. McClintock was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

NELSON, CHARLES ROBERT. Died in Oakland, February 27, 1949, aged 78. Graduate of the University of Pittsburgh School of Medicine, 1895. Licensed in California in 1895. Dr. Nelson was a member of the Alameda County Medical Association, the California Medical Association, and the American Medical Association.

✤

QUINN, WILLIAM JAMES. Died in Eureka, April 13, 1949, aged 72, of a heart attack. Graduate of the Cooper Medical College, 1905. Licensed in California in 1905. Dr. Quinn was a member of the Humboldt County Medical Society, a Life member of the California Medical Association, and a Fellow of the American Medical Association.

✤

SMYTHE, HUDSON. Died in Stockton, May 13, 1949, aged 73, of a heart attack. Graduate of the University of California Medical School, Berkeley-San Francisco, 1901. Licensed in California in 1901. Dr. Smythe was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

VALLEE, JOHN EDWARD. Died in Los Angeles, February 13, 1949, aged 78. Graduate of the University of Vermont College of Medicine, Burlington, 1903. Licensed in California in 1917. Dr. Vallee was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

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NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Announcement of awards of **fellowships for research in heart disease** to two Los Angeles physicians was made recently by the Life Insurance Medical Research Fund. One of the fellowships went to **Dr. John Leyden Webb,** who will conduct a research project at the University of Zurich, Switzerland, and the other to **Dr. Howard Goodman** for work to be carried out at Cedars of Lebanon Hospital under the supervision of Dr. Thomas Addis and Dr. Jessie Marmorston. Awards from the fund, which is contributed to by life insurance companies of the United States and Canada, will total $680,000 this year for support of research in heart disease.

* * *

A $7,200 **grant for research** at the University of California at Los Angeles school of medicine has been awarded by the American Cancer Society to **Dr. Abraham White,** chairman of the department of physiological chemistry, according to a recent announcement by Dr. Stafford Warren, dean of the medical school.

Dr. White's research will be concerned with the biochemistry of the lymphocyte. Much of this study will be devoted to the determination of the nature, quantity and functions of the various constituents of normal and malignant lymphocytes. as an approach to an understanding of one type of leukemia.

SAN FRANCISCO

A number of **faculty changes** have been announced by the Stanford University School of Medicine. On September 1, 1949, the following professors will retire from their active teaching duties with the title emeritus: Dr. George D. Barnett, professor of medicine; Dr. Charles H. Danforth, professor and executive of the department of anatomy; Dr. James R. Dillon, clinical professor and chief of the division of urology; Dr. Harold K. Faber, professor and executive of the department of pediatrics; Dr. Frank W. Weymouth, professor and executive of the department of physiology.

Dr. Charles E. Smith, professor and executive of the department of public health and preventive medicine, has resigned from the faculty of Stanford Medical School effective September 1, 1949. Dr. Smith has accepted an appointment in the Graduate School of Public Health at the University of California in Berkeley.

The following new appointments and promotions were announced:

Dr. John A. Anderson as professor and executive of the department of pediatrics. Dr. Anderson has been professor of pediatrics and executive of that department at the University of Utah for the past five years.

Dr. Henry Weyrauch, clinical professor and chief of the division of urology. Dr. Weyrauch has been a member of the faculty of the University of California School of Medicine since 1937.

Dr. J. K. Lewis has been promoted to professor of medicine and will succeed Dr. George D. Barnett on the Stanford service at the San Francisco Hospital.

Dr. William W. Greulich will succeed Dr. Charles H. Danforth as executive of the department of anatomy.

Dr. Rodney R. Beard has been promoted to professor of public health and preventive medicine and will succeed Dr. Charles E. Smith as executive of that department.

Dr. Jefferson Crismon, associate professor of physiology, has been appointed acting executive of the department of physiology.

In addition to department heads and division chiefs, several other appointments have been made, effective September 1, 1949:

Dr. Robert H. Alway as associate professor of pediatrics. Dr. Alway has been a member of the faculty of the University of Utah School of Medicine for the past four years.

Dr. Lyman M. Stowe, now at Yale School of Medicine, as assistant professor of obstetrics and gynecology.

Dr. George W. Henry as instructor in radiology.

The following promotions become effective September 1, 1949:

Dr. Hadley Kirkman and Dr. Donald James Gray have each been promoted to professor of anatomy, and Dr. Robert S. Turner to associate professor of anatomy.

Dr. Donald E. King has been promoted to professor of surgery (bone and joint surgery).

Dr. Robert H. Dreisbach has been promoted to associate professor of pharmacology.

Dr. Robert S. Evans has been promoted to associate professor of medicine in charge of clinical pathology.

SAN MATEO

Dr. Carl L. Hoag of San Mateo was reelected president of the San Mateo County Blood Bank at the annual meeting of that organization held late in April. U. S. Simonds, Jr., mayor of Burlingame, was reelected vice-president, and Mrs. P. J. Hanzlik secretary-treasurer. Dr. Hoag reported at the meeting that more blood was drawn and processed during the past year than in any other year since the bank has been in operation, including the war years. A total of 1,906 donors gave 3,633 pints of blood during the 12-month period, Dr. Hoag said.

* * *

Dr. James M. Bodie, who for the past three years has been a member of the resident staff at the San Mateo County Hospital, has been appointed assistant medical superintendent of Canyon Sanatorium by Dr. Harold D. Chope, county health director.

SHASTA

Dr. Thomas D. Wyatt recently was named Shasta County physician and health officer and supervisor of the county hospital for a period of one year under an oral agreement with the county board of supervisors. He takes the place of **Dr. B. F. Saylor.** The board of supervisors by a 3 to 2 vote rejected a plan offered by the Shasta County Medical Society under which society members would rotate in treating patients at the county hospital under a county resident physician approved by the society.

SOLANO

Dr. Richard Golton, formerly of Berkeley, last month was appointed medical director of the Solano County Hospital at Fairfield to take the place of Dr. J. N. Clark. At the time the county board of supervisors named Dr. Francis DeBon, also of Berkeley, assistant medical director.

GENERAL

Plans to ask Army **reserve medical officers** to volunteer for short periods of duty each month at stations near their homes were announced last month by Major General Raymond W. Bliss as part of a program to relieve a medical staff shortage. General Bliss said that 14,300 physicians and 5,548 dentists on reserve status would be asked to serve for one to 29 days a month.

Meanwhile, Secretary of Defense Louis Johnson, who said that California has been assigned a quota of 305 physicians and dentists in the campaign to augment the armed services staff, reiterated an appeal to those who were given deferment from wartime service to complete their education, as well as those who received all or part of their education under government auspices, to volunteer now for active duty. Johnson said that many of the professional men in this category who have not served in the armed forces have replied negatively to a previous appeal.

* * *

The American Congress of Physical Medicine will hold its 27th annual scientific and clinical session September 6, 7, 8, 9 and 10, 1949 inclusive, at the Netherlands Plaza Hotel, Cincinnati. All sessions will be open to members of the medical profession in good standing with the American Medical Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

* * *

Public health officers to serve in civilian capacity with the **occupation forces in Japan** are urgently needed, according to announcement by the Department of the Army. Minimum qualification requirements are a degree in medicine plus one year of internship. Experience in public health work is not mandatory. Salary for the positions is $6,235.20 a year plus 10 per cent post differential with quarters provided at no extra cost to the employee. Appointees must agree to remain in Japan at least two years, but dependents may join the employee in about six to eight months after his arrival in the command, the announcement said.

Further information may be obtained from the Department of the Army, Overseas Affairs Branch, Civilian Personnel Division, Washington 25, D. C.

* * *

Bringing to 13 the total number of **hospital construction projects** approved for funds available during the present fiscal year under terms of the Hospital Survey and Construction Act, the Hospital Advisory Council of the California Department of Public Health has given approval to four new district hospital proposals: Merced County Hospital; West View Hospital (Los Angeles); Marin County Hospital District; Biggs-Gridley Memorial Hospital (Gridley).

* * *

Dr. Walter T. Harrison, who for the past seven years has been director of the U. S. Public Health Service for the West Coast area, with headquarters in San Francisco, will retire July 1, 1949. Dr. Harrison, who entered the U.S.P.H.S. in 1916, now is on terminal leave and **Dr. Henry C. Schumacher** is serving as acting health director for the area until a successor is appointed.

* * *

The board of trustees of the **National Physicians Committee for the Extension of Medical Service,** formed ten years ago to function in fields in which the American Medical Association did not then operate, recently issued formal announcement that it ceased all activities as of April 1, 1949, and would dissolve the organization. This action was taken, the announcement said, in view of the fact that the A.M.A. has set up an agency of its own to carry on public relations activities and to further the extension of medical care.

* * *

INFORMATION

Licensure of Foreign Medical Graduates*

The licensure of physicians who have received their medical degrees from foreign institutions seems certain to present a growing problem for the licensing bodies of the forty-eight states, the District of Columbia and the territories and outlying possessions of the United States, and for the National Board of Medical Examiners. The unsettled economic and political conditions in many parts of the world have already stimulated many physicians to migrate to the United States and it may be predicted that the number seeking to migrate will increase in the years ahead. In addition, each year a number of Americans enter foreign medical schools with the expectation of returning to the United States to practice. Some of these students study abroad because they are unable to gain admission to an American medical college, while others do so from choice.

The problem of the physician who has graduated from a foreign medical school promises to confront the public, various legislative bodies and the licensing boards with increasing frequency during the next several years. The problem has important and far reaching implications for the health and safety of the people of the United States. It is important, therefore, that the public be provided with information to serve as the basis for intelligent opinion and that legislative and licensing bodies be prepared to adopt an enlightened policy in deciding questions pertaining to the licensure of foreign-trained physicians.

Two basic principles are involved in the licensure of physicians whether they be graduates of domestic or foreign schools. The first principle and one that has long been recognized by all states and nations is the requirement that a physician satisfy a licensing body representing the public as to his competence before he is permitted to practice. This principle is essential for the protection of the public. Without this requirement, the people of a community cannot distinguish those physicians who are competent to provide medical care from those who are not.

Similar requirements for licensure or equivalent certification by an appropriate public agency have been established for the protection of the people in many professional and non-professional occupations. Such occupations include architects, dentists, engineers, veterinarians, lawyers, nurses, electricians and plumbers. The principle of licensure by legally created agencies of the state has become so well established in our society that its value and validity cannot be questioned.

The second principle involved is that the training a man has undergone in preparing to enter a profession is a paramount factor in determining the quality of his professional practice. It must be admitted that exceptional men may rise above the limits of their training, but this achievement is frequently accomplished only after years of experience in practice and additional training. To allow an inadequately trained physician to attempt to perfect himself through the mistakes of years of practice is to permit unwarranted and unnecessary abuse of patients who entrust their health and lives to him.

An important corollary of this second principle is that the best assurance of the quality of the training that a physician has received is an intimate knowledge of the faculty, facilities, curriculum and standards of the medical school from which he has graduated. The art and science of conducting examinations has not yet advanced to the point where full reliance can be placed on the results of the type of examinations to which licensing boards are limited by considerations of practicality. Only when the results of such examinations are coupled with an evaluation of the quality of training that a physician has received can a licensing board be reasonably confident that a physician is adequately prepared to assume the responsibilities that are an inevitable part of his practice.

In licensing graduates of American and Canadian schools, the various state licensing boards have for many years had the benefit of the findings of periodic thorough surveys of these schools carried out by the two accrediting bodies, the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. Some of the state licensing boards supplement this information with investigations of their own although it is beyond the resources of most boards to inspect periodically all the eighty medical schools in the United States and Canada.

It should be pointed out that the present high standards of medical practice in the United States have been the direct result of the recognition by the licensing boards that evaluation of the school from which a physician graduates is equally important as evaluation of the physician himself. Before this principle was generally recognized, the country was overrun with physicians who, armed with a degree from a low-grade school or outright diploma mill, succeeded in one way or another in passing the examinations for licensure. The needless suffering and injury perpetrated by the incompetent and at times fraudulent practices of many of these inadequately trained men constitute a dark chapter in the history of medicine.

While it has been possible for the two accrediting agencies referred to above to maintain current appraisals of the quality of education offered by American and Canadian medical schools, it has been beyond their resources to attempt to maintain a similar inventory of the three hundred or more medical schools in other parts of the world. For many years this was not important because the number of physicians migrating to the United States was small and most foreign trained physicians came from medical schools that were well known in America.

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*Prepared by the Committee on Foreign Medical Credentials, an unofficial body sponsored by the Council on Medical Education and Hospitals of the American Medical Association.

Between 1930 and 1939 two developments occurred that entirely changed the situation. Unsettled and unfavorable conditions abroad prompted large numbers of physicians to migrate to this country. At the same time, internal developments in many countries led to a rapid deterioration in the quality of medical education. This change, which was readily apparent to American physicians travelling abroad in the years immediately prior to the war, was greatly accelerated when these countries became involved in World War II. The pressures of the war reduced the quality of medical education in all countries, including the United States, but in many countries the effect was catastrophic. Faculties were decimated, buildings, libraries and equipment were destroyed or badly damaged, all contact with scientific developments in other countries was interrupted and standards were lowered in an effort to turn out large numbers of physicians to serve the armies of the warring nations. By the end of the war, medical education in other countries, with few exceptions, had degenerated to a degree that was shocking to those who had known these countries in the period up to 1930. While medical education in the United States recovered quickly from the war and is now at the highest point in its development, unsettled political and economic conditions in many foreign countries have prevented any similar recovery. Even more disturbing is the fact that some foreign countries appear to be committed to educational policies that are so unsound and so inferior that there is serious doubt that satisfactory standards of medical education will be reestablished at any time in the foreseeable future.

It is against this background that the problem of the foreign trained physicians must be studied. Their complete exclusion from the United States cannot be reconciled with the traditional role of this country as the land of opportunity. The fact that few foreign countries will admit the graduates of American medical schools to practice should not be accepted as a valid reason for pursuing a reciprocal policy. It is well, however, for the people to know that the United States is the most liberal of all countries in licensing physicians who have not graduated from their own schools.

While a policy of complete exclusion cannot be defended, it is clear that until more information can be obtained about the present quality of medical schools abroad, the licensing boards would fail in their responsibility to the public if they did not use the greatest care and discretion in admitting foreign-trained physicians to their examinations.

Detailed current knowledge of foreign medical schools is indispensable for the guidance of state licensing boards in determining which foreign physicians have had sound training. It is essential that the various agencies concerned with this problem unite their resources and devise a satisfactory method for securing this information at the earliest possible date. It will not be an easy task and it is improbable that well documented evaluations can be made of all foreign schools in the same manner as is done for American and Canadian schools. The geographic and physical aspects of the problem alone present great difficulties. International relations will undoubtedly also limit the extent to which a study can be carried out. One of the greatest difficulties will be to appraise accurately the great changes and fluctuations through which many schools have passed and are continuing to pass.

From such a study, however, it should be possible to derive a list of foreign medical schools which have maintained during specific periods, or are now maintaining, educational programs sufficiently comparable to the training offered by the medical schools of this country to warrant the admission of their graduates to the examinations of the licensing boards of the forty-eight states, the District of Columbia and the territories and outlying possessions of the United States as well as the examinations of the National Board of Medical Examiners.

As an added safeguard it would seem entirely reasonable that whenever a candidate cannot present evidence to a state licensing board that he is sufficiently familiar with recent scientific advances in medicine, with the practices and customs of American medicine, and with the English language, that he be required to take additional training in this country before being permitted to appear for examination. There is every reason to believe that the various licensing boards can develop regulations covering these points that will be fair to the foreign graduate and adequate to protect the public.

The American people are today well served by the licensing boards which they have duly constituted by law to protect them from incompetent practitioners of the healing arts. It is to be hoped that the people will continue to have the confidence that these licensing bodies are acting for their best interests according to well established principles.

The licensing bodies and the governments to which they are responsible have a heavy obligation to continue their efforts to maintain high standards of medical practice. They must also recognize that the spirit and tradition of America places upon them an obligation not to deny the opportunity to practice his profession to any citizen or prospective citizen who can demonstrate satisfactory qualifications as to his professional competence and character.

If the problem of the foreign medical graduate is approached in this spirit, the Committee on Foreign Medical Credentials is confident that it will be solved without lowering the standards of American medicine and in a manner consistent with our national ideals of justice and humanitarianism.

BOOK REVIEWS

THE CHILD IN HEALTH AND DISEASE—A Textbook for Students and Practitioners of Medicine. By Clifford G. Grulee, M.D., Rush Professor of Pediatrics, University of Illinois, Chief Editor, American Journal of Diseases of Children; and R. Cannon Eley, M.D., Associate in Pediatrics and Communicable Diseases, Harvard University Medical School. The Williams and Wilkins Company, Baltimore, Md., 1948. $12.00.

When a new text in a field as broad as that of pediatrics appears, the potential purchaser asks what it has to offer that is not to be found in other current texts and the reviewer asks himself what is the purpose for which this potential purchaser purchases his reference books. In general, this purpose is to supply him with information not hitherto available to him from his own experience or from his personal library and journals. Such desired information is often in the domain of unusual diseases, of recent additions to medical knowledge relevant to his practice, especially diagnostic procedures and therapy. A prime requisite for any reference volume is a thoroughly adequate index.

There are now two American one-volume pediatric texts of outstanding merit: the Holt-McIntosh "Holt's Diseases of Infancy and Childhood," eleventh revised edition; and the Mitchell-Nelson "Textbook of Pediatrics," fourth edition revised. The former, published in 1940, and now understood to be in the process of revision, is in some respects out of date but in the opinion of the reviewer remains, more than any other, the ideal text regarding the requirements above noted, with the Mitchell-Nelson, dated 1945, a fairly close second. Both have adequate indexes. The present volume edited by Grulee and Eley is of about the same size and invites comparison with the other two. It is actually composed of units written by 75 different authors (only five from the Pacific coast), as compared with 35 in the Holt-McIntosh and 49 in the Mitchell-Nelson. With so various a composition, the merit of individual chapters is bound to vary greatly, but on the whole the quality of the contributors and of their contributions does not compare too favorably with that of the other two texts. Among those which are of special value are: Physical Growth and Development, by J. A. Johnston; Pediatric Pathology, by Sidney Farber; Vitamins and Avitaminosis by Drake and Tisdall; The Normal Newborn, by Clifford and Berenberg; Meningococcic Meningitis, by Hoyne; Poliomyelitis, by Wilson; Immunization Procedures, by Shaw; Streptococcal Infections, by Boisvert, Powers and Dunphy; Allergy and Eczema by Bratner and by Hill; Poisoning, by Aikman, Eley and others; First Aid, by Harrison; Pediatric Techniques, by Grulee, Jr., and Birdsong; and Juvenile Diabetes, by Priscilla White. The sections on Adolescence by Beverly and others, and on Pediatric Surgery by Coe will also be found useful.

It is when one attempts to look up specific subjects that the defects of the present volume and the inadequacy of the index becomes noticeable. For instance, retrolental fibroplasia—a form of blindness occurring in premature infants, which has attracted much attention during the last five years—is not to be found in the index, and is only briefly and inadequately mentioned in the section on the eye. Epidemic diarrhea of the newborn, a disease of major importance in pediatrics, is the subject of two brief descriptions. Despite the demonstration by at least two groups of workers of a virus in the stools in this disease, virus etiology is not mentioned and the cause is stated "most often" to be the hemolytic streptococcus, a view which is contrary to that now generally accepted. The life-saving measures described by Darrow and his associates are not mentioned; indeed, the whole subject of fluid and electrolytic replacement is poorly covered. The physician wishing to learn and apply proper therapy would find no help here; this is particularly strange in the case of a work specifically intended, according to the preface, for the practicing pediatrician. According to the index, the only mention of electrocardiography is in relation to diphtheria. The section on coccidioidomycosis, written by an Illinois physician, ends with a statement (based on irrelevant guinea-pig experiments) that the sputum is infectious and that isolation of patients should be like that of patients with tuberculosis. This view is not correct according to Smith and his associates, who have had the largest personal experience with the disease.

In view of the widespread interest in congenital anomalies of the heart and great vessels, it is strange to find that the section on this subject, written by Gibson of Chicago, does not mention the operative procedure devised by himself and Potts, which has now been used in many cases and particularly at ages earlier than the period when the Blalock-Taussig procedure can be done to best advantage; nor is there mention of Gross's valuable procedure for the relief of tracheoseophageal constriction by double aorta and related anomalies. Moreover, Gibson's statement that in congenital cardiac anomalies, an "exact anatomical diagnosis is rarely possible" does not correctly represent the status of modern knowledge in the light of angiocardiography (which is not mentioned), right heart catheterization, and other aids, all of which render a fairly exact diagnosis decidedly possible in a great many instances, and are of the greatest value in assessing the indications for operation.

The section on stomatitis does not mention herpes virus, which has been found by at least three independent groups of workers to be the cause of the acute gingivostomatitis usually ascribed erroneously to the Plaut-Vincent organism. In the case of another characteristically pediatric disease, acrodynia, no mention is made of recent observations that it may be due to mercury poisoning (usually calomel) and that it has been succeessfully treated with BAL. In the section on cerebral palsies the important factor of prenatal injury, especially from placental separation and toxemia, is not mentioned. The treatment of subdural hematoma, so ably described by Ingraham several years ago, is not only cursorily but actually dangerously dealt with, since it is stated that "immediate evacuation" is the correct treatment, whereas Ingraham emphasizes the importance of preliminary day-by-day gradual withdrawal of blood to avoid the hazards of sudden decompression. The section on endocrines leaves much to be desired; thus, in the discussion of precocious puberty, it is stated that the usual cause is tumor of the adrenal gland, whereas this is true only of the male; the granulosa cell tumor of the ovary—which should always be looked for in females since it is malignant and requires early removal—is not mentioned. The discussion of premature closure of the cranial sutures is quite inadequate and the operation which gives protection against and relief from the important complications of blindness and intracranial hypertension is not mentioned.

It is, of course, impossible for a reviewer to read through completely such a volume as this, but from the samplings mentioned it seems to be a fair judgment that this new pediatric text leaves much to be desired, and that the practicing pediatrician depending on it alone will not find in it much of the information needed in the care of his patients. On the other hand, there can be no question that if he already has other texts at hand, he may find a number of subjects better covered here than elsewhere.

HERNIA: Anatomy, Etiology, Symptoms, Diagnosis, Differential Diagnosis, Prognosis, and Treatment. By Leigh F. Watson, M.D., F.I.C.S. Third edition. Cloth. Price, $13.50. Pp. 732, with 323 illustrations by Helen Lorraine, Willard C. Shepard and Ralph Sweet. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, 1948.

This book is an excellent treatise on the subject of hernia wherein the author admirably discusses all features such as the historical, embryological, anatomical, clinical and operative repair of the many different herniae found in the body. The medical drawings by Helen Lorraine, Willard C. Shepard and Ralph Sweet are as outstanding as those found in any surgical treatise. By means of these illustrations and succinct descriptions, the author takes the reader through the consecutive steps in the operative repair of hernia.

Why he devotes seventy pages to the injection treatment of hernia, a procedure which is of questionable or no value, is hard to say.

This book is highly recommended to all general surgeons, and to those who wish to have the aspect of all types of hernia presented in a single volume.

* * *

BIOCHEMISTRY OF THE TEETH. By Henry M. Leicester, Ph.D., Professor of Biochemistry, College of Physicians and Surgeons, San Francisco. The C. V. Mosby Company, St. Louis, 1949. $5.00.

This book is divided into eight informative chapters. The first chapter describes the chemical composition of the parts of the tooth, discusses variations in composition, and critically reviews the chemical methods. The basic apatite structure of tooth minerals is considered in detail, and earlier contradictions are resolved. In the second chapter, physical properties of teeth are discussed under headings of density, hardness, radiopacity, solubility, optical properties, fluorescences, electrical resistance and permeability. Chapter 3 describes the processes involved in the development of the tooth, including both histological and biochemical factors. Mineral metabolism and effects of diets and of ingestion of various substances, including fluorine, make up Chapter 4; Chapter 5 describes the effect of vitamins and Chapter 6 the effect of hormones on the developing tooth. Chapter 7 is devoted to a description of the dynamic chemical processes taking place in erupted teeth. The final chapter is devoted to the biochemical factors in caries formation. A critical appraisal is given of acid formation by Lactobacillus acidophilus and other organisms, plaque formation, saliva, general body metabolism, diet, vitamins, especially fluorine, activity of the protein matrix of the tooth, and still other factors in the production and control of caries.

The book is interestingly written and logically arranged; the author attempts to give opposing views on controversial points and to resolve the contradictions. Each chapter includes an extensive bibliography related to the subject matter of the chapter.

* * *

EMERGENCIES IN MEDICAL PRACTICE. Edited by C. Allan Birch, M.D., F.R.C.P., Physician, Chase Farm Hospital, Enfield, 113 illustrations, 8 full color plates. The Williams and Wilkins Company, Baltimore, Maryland, 1948. $7.00.

This is a well prepared collection of medical essays on medical emergencies which the author defines as a condition or circumstance of a patient which calls for immediate action other than surgery. It is quite elementary, though thorough, and would be a fine book for the young general practitioner or a man in emergency service. There are 18 contributors to this book, all well qualified men who have written separate chapters on specific emergencies in their field. Every type of emergency that can be thought of is included in this text and the treatment as recommended by the authors is very good. It is all-inclusive from the emergencies in childhood to the making out of wills on the deathbed. It would be an excellent book for medical students to have on their shelves.

* * *

AN ELEMENTARY ATLAS OF CARDIOGRAPHY—An Introduction to Electrocardiography and X-Ray Examination of the Heart. By H. Wallace-Jones, M.D., Honorary Consulting Physician, Royal Liverpool United Hospital; E. Noble Chamberlain, M.D., Honorary Physician, Royal Liverpool United Hospital; and E. L. Rubin, M.D., Honorary Radiologist, Royal Liverpool United Hospital. Incorporating the Third Edition of **Electrocardiograms** with 100 illustrations. John Wright and Sons, Ltd., Bristol, 1948.

This book is a very elementary discussion of electrocardiography that scarcely warrants treatment in the form of a book. There is no discussion of the precordial leads. The discussion of each electrocardiographic pattern and arrhythmia is so brief as to merely "scratch the surface." In addition, there are some errors; for example on page 12, it is stated that the P-R interval corresponds with the time taken by the excitation wave to pass through the bundle of His. The authors state that the average QRS interval is 0.05 to 0.06 seconds, which are rather low figures.

The illustrations on bundle branch block imply that axis deviation is important in the diagnosis of left as compared to right bundle branch block and no not adequately discuss the modern opinion.

Other examples could be cited. In the discussion of Preponderance, the authors did not adequately differentiate left ventricular hypertrophy from left axis deviation.

The section on the Cardiac Radiology is far superior. The illustrations are excellent and the text is quite clear.

In general, the book may be recommended for its section on Radiology but other primers of Electrocardiography, such as that by Burch and Winsor, are far superior.

* * *

DIABETIC MENUS, MEALS AND RECIPES. By Mrs. Betty M. West, with introduction by Russel F. Rypins, M.D. Doubleday and Company, Inc., New York, 1949. 254 pages. $2.95.

Mrs. West in this volume has performed a real service to all diabetics. In her dual capacity as patient and housewife she has computed the food values of a large number of standard household recipes and indicated the carbohydrate, protein and fat values of suitable individual servings of the completed whole. She also illustrates how these servings may be included in completely planned meals. All the foods mentioned, the recipes and the planned meals, are equally suitable for other members of the family. The non-diabetic members may supplement these meals by extra servings, additional bread and even sugar if they choose. The preparation of special foods or meals for the patient alone can be easily avoided by following the author's suggestions. There are chapters on cocktails, soups, salads, meats and seafood, vegetables, breads, muffins and pastry, soybeans, sauces and salad dressings, egg recipes and desserts. There are also adequate chapters on the canning of all the major fruits and vegetables without sugar.

The diabetic world is divided into two approximately equal groups: those who follow the classic line of grouping fruits and vegetables into 5, 10, 15 and 20 per cent categories as to carbohydrate content, and the "Moderns" who subdivide these items into 3, 6, 9, 12 per cent and other groupings. Mrs. West belongs to the old school. For practical purposes it makes little real difference which system one uses and few patients will be confused regardless of their training and mathematical habits.

It is a pleasure to recommend this book to all diabetics and to those who advise and teach these patients.

CARDIOLOGY. By William Evans, M.D., Physician to the Cardiac Department of the London Hospital, Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, N. Y., 1948. $7.50.

This book, intended to occupy a place between that of a general medical text and exhaustive treatise on heart disease, will probably fail to fulfill the expectations of the average reader. Most aspects of heart disease are covered in sections based upon lectures given by the author to graduate students. Perhaps because of limitation of space but partly because of an overabundance of illustrations the text is in many cases too brief for an adequate discussion of important topics. It is difficult to find a straightforward discussion of how to give digitalis to the average patient with heart failure or of the use of a low-sodium diet, and the treatment of subacute bacterial endocarditis is covered in one short paragraph. Greater use of phonocardiograms is made than in most texts, but the introduction of unfamiliar terms instead of those in current use is confusing. The discussions concerned with x-ray examination of the heart are good and the reproduction of radiograms superb.

* * *

THE VENEREAL DISEASES—A MANUAL FOR PRACTITIONERS AND STUDENTS. By James Marshall, M.D., B.S., Director, Venereal Diseases Clinic, Royal Northern Hospital, London. Second Edition. Macmillan and Co., 60 Fifth Ave., New York. 1948. $5.50.

This 357-page "Manual for Practitioners and Students" is very well named, for it is just what the name suggests. It is divided into four parts. Part one deals with the diagnosis and treatment of gonorrhea in the male and female. It includes an excellent description of the anatomy of both and the technique of a thorough examination for the detection of disease. The possible complications to be looked for with suggestions for their prevention is the subject of one chapter. A very comprehensive outline of treatment both pre- and post-penicillin is found in this section. Part two covers in an excellent manner practical information upon the diagnosis and treatment of early and late syphilis. Part three describes the other less common venereal diseases and certain so-called non-specific infections which must be differentiated from venereology. Part four gives practical instructions covering office technique in the treatment of gonorrhea, syphilis and the complications of each.

It is unfortunate that when the first edition of the book was revised, penicillin was apparently not readily available in England and therefore older forms of treatment for gonorrhea such as sulfa and fever therapy, instead of being placed in the chapter on history of treatment, were included as current methods.

This book would make a useful addition to the practitioner's library particularly because of its well illustrated chapters dealing with the diagnosis of venereal and allied diseases. The reader must keep in mind that this book was written by an Englishman and of necessity the British methods of treatment will not correspond entirely with our own.

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CALIFORNIA MEDICINE

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KEY TO ABBREVIATIONS USED IN INDEX

(Or.)—Original Article.
(Ed.)—Editorial.
(MP)—Medical Progress.
(CPC)—Clinical-Pathological Conference.
(CS)—Clinical Symposium.
(CMA)—California Medical Association.
(CR)—Case Report.
(I)—Information.
(LE)—Letters to the Editor.
(MJ)—Medical Jurisprudence.

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